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NO. I

ESTHETOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED TO GIVE PLEASURE

By J. W. POWELL

INTRODUCTION

Qualities arise out of the properties of bodies when they are considered in relation to human purposes. To understand this declaration it is necessary to consider the essentials of properties and qualities and carefully to note the distinction between them. The essentials of the properties are unity, extension, speed, persistence, and consciousness, which, under relations, give rise to properties that can be measured. These properties are number, space, motion, time, and judgment.

Number is many in one, and the enumeration of the many is the measuring of the number contained in the sum which is a unity. Number, therefore, is many in one.

The second property is space; its essential is extension, but many extensions give rise to relative position, and the positions can be measured. Hence extension and position constitute space, and space is a property that can be measured.

Speed is the essential of motion, but the same particle in motion traverses a path. Motion, therefore, is speed and path,

and can be measured in terms of space. Speed and path constitute motion.

The essential of time is persistence, but the relation of time is change; change may be measured in terms of motion. Persistence and change constitute time, and time is a property.

The essential of judgment is consciousness of self. Its relation to others is inference about another. This inference about a property can be measured in terms of that property. Consciousness and inference produce judgment. It is always the relational element of a property that can be measured.

As the essentials are developed into mathematical properties, so again the mathematical properties are developed by incorporation into classic properties through another degree of relativity. In the development of number into class, unity becomes kind and plurality becomes series. In the development of space into form, extension becomes figure and position becomes structure. In the development of motion into force, speed becomes velocity and path becomes inertia. In the development of time into causation, persistence becomes state and change becomes event. In the development of judgment into conception, consciousness becomes recollection and inference becomes conception. Hence the classic properties are class, form, force, causation, and conception.

There are thus five essentials, and each one produces two reciprocal properties: Unity produces number and class, extension produces space and form, speed produces motion and force, persistence produces time and causation, consciousness produces judgment and conception. The mathematical properties and the classic properties are reciprocal in this: that they are two aspects of the same thing, each one postulating the other. These are the properties found in all bodies of the universe—molecular, molar, and stellar alike.

For the doctrine of properties here set forth the reader is referred to a previous publication bearing the title *Truth and*

Error, or the Science of Intellection, where he will find these propositions demonstrated.

There are still other relations which bodies bear to one another. All the bodies of the universe have relation to human beings which are good or evil. These relations constitute another grade of relativity and are qualities. The properties give rise to qualities, for every property may produce a quality when it is considered in relation to human purposes. A number may be few or many for a purpose. Ten cents may be few if we desire to purchase a dozen oranges, but ten cents may be many when we desire to purchase but two; yet the property remains the same. A thousand dollars may be few if we desire to purchase a farm, or many if we desire to purchase a coat; but the property remains the same. A pane of glass may be small if we desire to use it in an exhibition window, or it may be large if we desire to use it in a carriage; but the property remains the same. A stone may be small if we use it in the foundation of a house, and it may be large if we wish to throw it as a missile; but the property remains the same. An hour seems a short time when I am thinking about a journey to California, but seems a long time to endure pain; yet the property remains the same. The fall of a spark from a passing engine seems but a trivial cause when I consider the soiling of my garment, but it seems to be an important cause when I consider it as igniting a forest fire; yet the property remains the same. An earthquake seems to produce but a slight effect when I observe it simply as a tremor, but when I consider it in the ruin of a city it appears to have a stupendous effect, though the property remains the same. I see a man slyly approaching a wall, and believe him to be a thief, and I have a judgment of evil; if I know that he intends to scale the wall in defense of his country, I believe him to be patriotic and brave: thus the same act may be cowardly and vile or patriotic and brave from different points of view.

Properties belong to things in themselves, but qualities exist

in the mind as properties are viewed in relation to human designs. Qualities are relations, and the terms of the relation are properties on the one hand and purposes on the other. Now, we cannot expunge either of these terms without expunging the relation. We may not overtly consider the terms, but consider only the relation as an abstraction. Then the terms must be implied, for there is no quality unless there is an external property and an internal purpose. When properties are considered as qualities in their relation to human purposes, the judgments formed are judgments of good and evil. The judgments which men form of good and evil give rise to a multitude of human activities which are known as the arts. Those activities which are put forth to secure pleasure and to avoid pain are esthetic arts, and the science of the esthetic arts is *Esthetology*.

We discover the properties of things as causes through our senses, and we discover the effect of these properties on ourselves through our feelings. One term of the relation, therefore, is discovered by making intellectual judgments; the other term is discovered by making emotional judgments.

Of the judgments of truth and error I have treated in the work previously cited; the judgments of good and evil constitute the theme of the present article. In order that we may set forth the characteristics of these judgments, it becomes necessary to set forth the characteristics of the art activities in which men engage for the purpose of securing good and avoiding evil.

AMBROSIAL PLEASURES

Pleasures arise as demotic arts when they are designed to please others—the people. A lad may play ball for his own pleasure; but the professional ballplayer plays for others, his own immediate purpose being gain or welfare. This distinction must be kept in view: Pleasures are first egoistic, but soon become altruistic. When they become altruistic as pleasures they become egoistic as industries.

The metabolic sense is the sense of taste and smell, these being varieties of one sense. While yet in the animal state, man learns to enjoy the ambrosial senses in partaking of food and drink and in inhaling the air laden with many particles given off by natural bodies; but in passing into the human state, man invents a multiplicity of devices for making his food, drink, and the air which he breathes pleasurable. All ambrosial pleasures are developed by experience, but the process of enhancing pleasures has its antithesis in the evolution of pain; hence many pleasures and their antitheses, pains, have been evolved during the historic period. Without entering into a systematic treatment of the subject, it may be well to illustrate this statement as the facts are shown in individual experience and in the history of peoples.

When the uninitiated person first attempts to use tobacco in any form, it is unpleasant or even loathsome; but gradually by experience he learns to tolerate it and finally to enjoy it. If its use was universal with men, women, and children, it cannot be doubted that an hereditary love of tobacco would be developed, and thus the taste of tobacco would become innate and the judgment of its pleasant effects would be intuitive. Its extensive use seems to indicate a tendency to an hereditary love of tobacco used in one or another of the customary methods, although the period for which it has been used dates no farther back than the discovery of America. That which we wish to emphasize in this place is that the pleasure derived from the usage is artificial and is developed by experience, and that while new pleasures originate, antithetic pains arise by the development of an appetite which, ungratified, is pain.

If we contemplate the use of intoxicant beverages, like facts appear, for it is found that pleasures of the inebriating beverage must be developed by experience, and again it is found that the love of these bacchanalian pleasures has a tendency to become hereditary and to engender an appetite that produces pain. In

the case of alcoholic beverages the tendency to inherit the taste is more fully developed than in the case of tobacco, and the taste has thus certainly become intuitive.

The love of the taste of some kinds of food of which man partakes and with which he has had experience for untold generations, seems to be hereditary and hence intuitive. The pleasure derived from the sipping of honey, sugar, and juices of fruits is innate from experience dating back to primordial life, for the evidence is at hand that all of these ambrosial pleasures are derived and can easily be lost.

Pleasure may easily be transformed into pain. The attar of rose is a pleasant odor intuitive from hereditary experience, yet it is within the experience of the writer that it may become loathsome. Once on a time an epidemic of cholera was carrying off its victims, and he attended many men, women, and children in the last sad office of life. It was midsummer, and raging heat prevailed, so rosewater was freely used until at last it became disgusting to him and has remained so, although gradually wearing away in later years.

Thus, when we consider that hereditary and innate pleasures may be transmitted into pains, and that new pleasures may be derived from old pains, the argument for the derivation of pain is in such cases made plain. Ambrosial pleasures and pains are artificial, and no insignificant portion of human activity is occupied in catering thereto.

The nature of ambrosial pleasures and pains and the activities which arise therefrom have been sufficiently set forth for the purpose of recognizing the group.

DECORATIVE PLEASURES

In science antithetic meanings are sometimes embraced in one term; thus degrees of plus or minus from a particular datum point are combined and their sum is expressed in one term. This practice will be found convenient in the science of psychology

and in all of the sciences of human activities. I shall therefore sometimes speak of pleasure and pain in terms of pleasure implying the antithetic term pain. Sometimes we have a word which has the force of its etymologic significance and also of its antithesis. "Welfare" is a word of this character.

Pleasures are teleologic; that is, they are potent motives for human activities. There is a group of activities produced by forms which result from pleasures. These may be denominated the pleasures of form from the standpoint of motive, or the arts of decoration from the standpoint of activities. Because there are pleasures of form there are activities of decoration, and hence there are arts of decoration.

Many activities produce objects solely to gratify the feelings of pleasure. Many activities are induced primarily by other motives and secondarily by pleasure. In the production of these objects, thought and labor are expended over and above the amount necessary to produce the object for utility in order that it may give pleasure, and if it does not give this additional pleasure it gives pain. Decorative activities are often of this character. An ornament may be designed wholly for decoration, as when jewels are worn; but a garment may have its chief purpose in utility, though a secondary purpose in ornamentation, and the form and color of the garment may be considered as having an importance almost equal to that derived from its utility.

Man is rarely content with utility, but he also desires pleasure from the objects which are produced through his activities. In both classes of endeavor the decorative arts are involved. The decorative arts are arts of form.

Architectural structures are designed primarily for a utilitarian purpose, but they are decorated. Vehicles have utilitarian purposes, yet many devices of decoration are used in their construction in order that they may be pleasing. Such illustrations serve to show the general nature of the decorative arts.

Primordially form is discovered by the sense of touch; but with

the development of vision, form is interpreted from symbols of color expressed in hue and tint. The form learned by vision is the form which is first learned by touch, but subsequently interpreted by vision, which assumes, through the agency of experience, that certain arrangements of light imply that the object must have certain adjustment of figure. The light reflected from the object impinges upon the eye and becomes a mark or symbol of the figure as primarily learned by touch—not that the particular object seen is first touched, but that the elements of form which it presents were first discovered by touch. Thus, vision becomes a vicarious sense for touch. Vision is deft, performing not only its fundamental function in the discernment of color, but instantaneously and skilfully it performs all the offices of touch in the discovery of form.

Here we have abundant evidence of the derivative nature of the decorative pleasures. By a course of experience, that which in infancy is unattractive, in maturer years becomes pleasurable; but more, that which is beautiful in childhood may become ugly in age, and that which was ugly in childhood may become beautiful in age. If the appeal is made to individual experience, all will testify to the derivative or evolutionary nature of pleasures and pains. The history of decoration is loaded with lessons. That which is beautiful in savagery is unattractive or positively ugly in modern culture, while that which is unattractive among the lower races of mankind may often appear as exquisitely beautiful in higher culture. That which we especially wish to note is that decorative pleasures and pains become intuitive by hereditary transmission, and these intuitive pleasures and pains may be transformed in the individual and the race. Our judgments of pleasure and pain depend on the point of view from which properties are contemplated. There is nothing in form itself to make it beautiful or ugly, but the form becomes beautiful or ugly through the agency of experience, by which certain forms are found to be desirable or undesirable as the case may be. A con-

stant cognition of such forms will produce a habit of forming judgments of beauty about them which ultimately become intuitive. Color becomes the symbol of form because color is on the surface and is indicative of surface and thus expresses figure; but there is nothing in colors themselves which makes them either beautiful or ugly. Every color is beautiful when it seems appropriate; every color is ugly when it seems inappropriate. Particular colors seem to be particularly beautiful because we have associated them with particularly beautiful things, while the very same colors will be considered particularly ugly when they recall things which we conceive to be ugly. Form or the symbol of form is beautiful or ugly only when it produces in the mind that effect by reason of the standpoint of the perceiver; that is, properties have not qualities in themselves, but qualities arise when we consider properties in relation to purposes.

With the sense of vision, the human mind having come to a knowledge of its power in transforming the environment by minute increments, gradually so transforms it for the pleasures of decoration. Exercising activities in making artificial transformations, human beings develop the sense of the beautiful and the ugly in qualities of art and transfer them to the properties of nature. In the evolution of decoration everywhere we find that it proceeds by degree of organization, that is, by the differentiation and integration of its elements. This is beautifully illustrated in architecture, where a monotonous multiplication of like elements is replaced by figures of differentiated elements. No longer is a uniform façade recognized as beautiful, but a variety of features in a variety of elements must be presented in order that a temple, a mart, an executive building, or a business structure may be considered as a pleasing example of architecture. Variety is now considered one of the essential elements of beauty.

ATHLETIC PLEASURES

In the esthetic arts we have to consider the pleasure derived from physical activity. In these arts appeal is made to the mus-

cular sense. The new-born beast and the new-born babe inherit more activity than is demanded for bare existence. Subject to the care of its elders, the infant is not called on for industrial activity, for its physical wants are supplied by others. While it is yet gaining its powers for utility, they are trained and expanded for pleasure. So the whelps of the lion play in the jungle, the fawns of the stag are gleeful in the glade, and lads and lassies are merry when they join in the dance.

A controversy has grown up in relation to those athletic plays which are here called sports, for we distinguish sports from another group of plays of which we are to treat hereafter as games. Sports are athletic activities, games are intellectual activities; sports develop from mimicry to rivalry, games develop from dependence on sorcery for success to dependence on skill for success. Now, if we understand the distinction between sports and games we are better prepared to understand the nature of sports themselves. Sports and games alike are activities, and the distinction which we draw between energy and activity has been set forth in the work to which reference has already been given; but an additional remark has now to be made.

Activity is that form of force which is controlled or directed by the mind, while energy is a form of force which is controlled or directed by another form of force, which is also energy. Energy involves action and passion as well as action and reaction. Action and passion are phenomena of force; action and reaction are phenomena of causation, action being cause and reaction being effect. In energy two or more bodies external to one another impinge upon one another and produce changes in one another. In activity one body has its path directed by the internal collision of its particles; activity is thus inherent only in animal bodies in which metabolism is controlled by the mind in such manner that the body itself may change its own path. The body itself has a degree of freedom to move to and fro in its hierarchal path by its own initiative. A stone cannot move from the hill to the valley

unless it is acted on by some other external force, when both the external body and the stone itself will have their paths changed; but the animal body may pass from the hill to the valley and back again by its own initiative, not that it can add energy to itself or subtract energy from itself; it cannot create or annihilate motion, but it can direct this motion in a path at will; it can pursue the path of its own choice. All this has been set forth fully in the former work.

All activities are controlled by motives, and the motive for sport is pleasure; but it is a pleasure of a particular kind—it is a pleasure in physical activity. Now, we must notice that it is the pleasure of the body whose structure and metabolism are inherited from its ancestors; hence it must be some kind of an activity consistent with the inherited structure. So far, then, the activity is fixed by inheritance, but within these fixed limits there is still great variety of activities from which to choose. What activity will the infant choose? Manifestly it will choose that activity which is suggested by its acts of psychosis as they are developed immediately after birth, and perhaps to some extent from prenatal activities which we may not here stop to consider. The first activities which the infant animal observes, if he belongs to any of the higher groups, is the activity of parents. Thus, the infant child makes judgments about parental activities, and by the law of genesis first strives to engage in the activities which it sees in the parents. Having supplied its wants for food, this food itself produces metabolic processes which ramify through its organ in excess of the amount necessary for digestion. With its inheritance of organization and superabundance of metabolic activity, it is ready to engage in other activities which are first taught by the parent as activities of nurture, and the infant is thus led to engage in mimetic activities. Connate with these are the activities of metabolism itself, the seizing, swallowing, and digestion of food; but the additional activities in which it engages are mimetic. Hence it is that a long succession of great scholars

have fully appreciated that sports depend on a superabundance of activity.

The plays of childhood are organized gradually to mimic the activities of elders. Kittens are trained by their mothers to play at catching mice, and puppies are trained by their mothers to play in mimic battle. Puppy wolves play at prowling, and kitten panthers play at fisticuffs. Kids play in racing, and nestling birds play in mimic flight. This universal instinct for play is exhibited in man through many years, in childhood on well into adult life. Athletic sports are universal alike in tribal and in national society. So sports of mimicry gradually develop into sports of rivalry.

Is the pleasure of sports a property of the activity, or is it a quality which depends on the point of view of the person engaged as well as the looker-on? It is within the experience of every normal human being that these pleasures grow and decay; but some are ephemeral and pass away in childhood, others pass away in youth, and still others pass away in adult age, while some undeveloped in childhood scarcely develop in youth, continue and grow in old age. Appealing to history, we discover that ephemeral pleasures become more ephemeral with advancing culture, while others become more intense by demotic development. The antitheses of pleasures, which are pains, pass through a like history in the individual and in the race. In all this field of activital pleasures it is discovered that they become intuitive by inherited experience, and that pleasures and pains alike are such from the point of view. We are therefore justified in affirming that pleasures and pains are qualities derived from natural properties.

This may be a stumbling-block, and hence it requires more elaborate consideration. I refer to the pain produced in the body by injury, as in cutting, tearing, concussion, compression, pinching, the stresses and strains produced by inflammation, the lesions of disease, and all the pains known as physical discomforts. Is the pain in the tooth a quality or a property? Is pain in the head a quality or a property? Is the pain from a bullet wound a quality

or a property? We have already seen that all other pleasures and pains are derivative in the individual and in the race, and appear from the point of view. Is this true of physical pain?

First, we must consider whether pain is an essential or a relational element.

Is pain, like pleasure, the product of judgment? Am I conscious of a pain, or do I infer it by an habitual judgment when the signs of pain appear in the body? Is the animal body endowed with pain as an essential, or is pain also the child of experience? In order that we may examine this subject somewhat critically, it becomes necessary to repeat briefly that which has been set forth more elaborately in a former work. There we begin with the definition of consciousness, inference, and verification. Consciousness is awareness of self, inference is awareness of the cause of the change in self, and verification is proof of the inference by experience. Now, we must especially call attention to the fact that the term consciousness is used only to signify awareness of self, and that it is not used to signify cognition. With this understanding we are prepared to proceed with the exposition. If we are conscious of physical pain, instead of cognitive, then pain itself is an essential; but if we are only cognitive of pain, it arises from inference and verification.

It is a well attested fact that a soldier receiving a musket-ball wound in battle may be so occupied with other occurring events,—so intent upon the progress of the battle,—that the wound itself may be unobserved and no pain for the time experienced. Then pain is not an essential inherent in animate matter itself, but something which arises from the point of view. It is within the experience of many men, perhaps all, that various injuries may be experienced without at once arising in consciousness, and that pain supervenes only on the cognition of the evil.

Again, physical pain grows with the experience of the individual. That which was a slight pain in childhood becomes an intense pain in adult life. In the history of races, bestial and

human, pain becomes greater with culture. The pains of lesions and bruises grow with developing culture; the pains of parturition increase as society becomes more refined, more highly developed in culture. From these and a multitude of considerations which the contemplating mind will recall, it is made plain that physical pains, like all our pains, are derivative; that we have no consciousness of pain when that term is strictly used, but we have cognition of pain.

We have seen how cognition becomes intuitive by hereditary transmission. From the earliest tribal life to the highest state of culture the way is long and the years are counted by millions. Every animate individual in all this time has experienced the effects of lesions and bruises until the concept has been woven into the constitution of mankind by experience, and the intuition is perfected through verified judgments. It is unnecessary for the man to pass through a complex ratiocination for the purpose of discovering this variety. A trivial accident may befall a soldier in line of battle which he interprets as a wound; he hears the coming of the shell from a piece of field artillery, it strikes the ground and scatters its fragments broadcast together with chips and gravel. A bit of wood strikes the soldier; he interprets it as a fragment of shell, has the illusion of being wounded, and feels the pain and expresses all the agony which a real wound may actually produce. Animate body is not endowed with an essential of physical pain, but it develops pain by cognition of effects.

In the evolution of sports we discover a development from individual and unorganized multiple activities in many individuals to organized activities, in which special activities are assumed for special purposes, all so differentiated and integrated as to accomplish a desired end. A hundred savages, men, women, and children, will join in a dance to revolve in a circle by uniform and rhythmic steps, and every one moves like every other one. But a game of baseball is organized so that every player has a particu-

lar function to perform which differs from the functions of all the others. This law of the organization of sports is universal.

GAMES

We now reach the fourth group of activital pleasures; these are games played in rivalry of skill and chance. Games have their root in sorcery as it is practiced by wildwood man. It seems at first that arrows or arrowheads are the pieces played—the pawns, knights, castles, kings, and queens of the game, or the cards upon which the actors are painted. In the wide geographical realm of tribal man many of these games are discovered; but they have common elements, that is, they are founded on universal concepts, and everywhere in this stage of society they are rooted in divination or the universal longing of mankind to know the causes of things and how effects may be controlled. In savagery men play for effects and control the causes, as they suppose, by necromantic figures which they carve or paint upon the pieces of the game; thus they try to win by sorcery. In later stages of culture the sorcery to a greater or less extent is abandoned, and skill is recognized as the true cause; but there yet remains an element of chance. With primal man chance and sorcery are the elements of all games, while with civilized man chance and skill are its elements.

There is a secondary though potent motive in games which inheres in the desire to take advantage for individual profit. For this reason gaming is universal among tribal men as gambling, and it is common among civilized men.

I have witnessed these games of sorcery among the aboriginal tribes of North America and have seen groups of men or women wager their ornaments and all their personal goods, even to their articles of clothing until their bodies were nude. As the game proceeds the villagers gather about and comment on the incidents of the game and recommend a variety of necromantic feats which they suppose will bring luck to their friends. Sometimes

the play does not stop for refreshment or sleep, until one or the other of the parties have lost all; yet will the play proceed with hilarity and end with a feast and a revelry of intoxication. I have heard that civilized men gamble with the same assiduity.

Hunting and fishing are primeval industries by which wild-wood men obtain no small portion of their food. To some extent in civilized society they still remain as industries. In fact, fishing is yet a fundamental industry. But hunting and fishing are now games, and the fruit of the play is called game. Although these activities are often called sports, in science we must call them games, as for success they depend on elements of chance and skill, and the real gamester or sportsman looks with some degree of contempt on the man who hunts or fishes for food.

FINE ARTS

The fifth group of activital pleasures is that of the fine arts. We have already seen that there is a group arising from a cognition of the pleasures which are derived from metabolism; a second group, called the arts of decoration, which arise from the cognition of the pleasures of form; a third group, called the athletic arts or the arts of sport, which arise from the cognition of the pleasures of force; a fourth group, called the arts of amusement, or games, which arise from the cognition of the pleasures of causation. Here we have a fifth group, which we call psychic arts, or the fine arts, and which arise from the cognition of the pleasures of mind expressed in fine-art works.

In order that we may adequately set forth the nature of the fine arts, it becomes necessary to make a fundamental classification of them.

In a former work we set forth the vicarious nature of the senses of muscular effort—hearing and vision. These are the senses to which appeal is made. These arts have played an important role in the evolution of mankind as demotic bodies, and hence they require more elaborate treatment.

When we desire to classify the fine arts, we find well demarcated groups from the standpoint of the properties of matter in the order in which these properties logically appear, from the simple to the most complex. We have, first, music; second, graphic art; third, drama; fourth, romance; fifth, poetry. That this is the logical order will appear when the subject is more thoroughly presented.

MUSIC

Music is the most fundamental of the fine arts in that it more fully expresses the emotions than any of the others, while it is but a feeble method of expressing the intellections. This characteristic is well known, and music has been called the art of expressing the emotions. It further appears that few persons ever learn to read the intellectual character of music when it is made by others or even when made by themselves. I do not mean that they fail to read the staff in which music is written, but I do mean that they fail to read the argument or story of the musical composition, but rest satisfied with the emotional effects produced. Very few persons read music as an intellectual art, and there are but few critics of the art who survey these intellectual elements. Indeed, the intellectual thread of a musical composition is very slender, and much of it in the folk song of the world is unconsciously developed, like the meaning of words in folk speech. It is a growth by minute increments found to be beautiful in experience.

Rhythm—Music has its germ in the dance, for it begins with the effort to control the rhythm of the lilting folk. Rhythm, therefore, is the first structural element of music, but new elements are added from time to time in the history of man as he proceeds along the way of life from wildwood time to the higher civilization in representative time—a time long indeed.

Melody—Passing from the hunter stage to the shepherd stage we find that a new element is added to music; then melody ap-

pears fully fledged. As the more complicated dancing steps become more pleasing than the primeval monotonous step, the melodic chant becomes more pleasing than the simple rhythmic chant; that is, a rhythm of rhythms is developed which makes melody. So music was endowed first with rhythm and then with melody.

Melody is a pleasing succession of sounds, or notes as they are called in written music, having a different pitch, and we have to consider how such notes come to obtain that quality which we call melody and which is so delightful to the hearer.

The dance is a sport in which usually many persons simultaneously engage. In primitive dancing the time is marked by the voice, and the shouts of the dancers constitute a chant in which oftentimes they all take part, but at other times there is a leader and only one marks the time. As the dance develops from the simple monotonous recognition of the same step to a combination of two or more differentiated steps, they are marked by differences in the pitch of the voice. To fully understand the ultimate effect of this device, we must appreciate the universality of dancing and that it continued in the first stage of society through thousands of years.

Harmony—In a succeeding stage of society, which we call the monarchical stage, or the tyrant stage, when tribal society was developed into national society, music made another advance by the introduction of a new element of pleasure. As these new elements appear from time to time in the course of human culture, it must be remembered that they do not come into view fully fledged, but that germs planted in primordial music slowly develop until they become recognized as elements of such importance that they receive designed development in the purpose of music makers. Now, there existed in primitive music the germ of harmony which, in the progress of the centuries, came to be considered by men of such importance that special efforts were made to improve that fully recognized element itself. The

new element added to music in this stage of culture is harmony. When music was but rhythm, there was a germ of harmony in it, for the waning sound would blend with the waxing sound, and the succession of sounds that become melodious also become harmonious; but more than this: in folk chant the voices of men and women differ in pitch, and still other differences arise in the commingling of children's voices. When music became melody, the bonds which held music to the dance were broken and melody was married to song as chant was married to dance; but song music was especially adapted to the development of harmony, because it became choral music; doubtless songs were sung by individuals for their amusement and as solos for the amusement of others, but when many join in the song we have choral music. Thus the blending of tones in melody becomes at last the blending of tones in harmony. The pleasure derived from harmony does not inhere in sounds themselves; sounds are colorless to the ear. The spoken word is but sound until it is informed with a meaning; so sound as sound has no power to create emotion until it is informed with an emotional meaning, and harmony is developed as a pleasure only by long experience. Perfect evidence of this is furnished through the modern and scientific investigation of folk music. Both the melody and the harmony of different races differ in the intervals of pitch exhibited in their music. This is proof that all men may read, and it clearly teaches that the pleasures of music are derivative.

Here let us pause for a remark about the attitude of idealism and materialism toward this question. Idealism affirms that not only is pleasure as a quality created by the mind, but that even the properties of sound itself are created by the mind. Materialism affirms that the property inheres in the sounding body and the quality also in the sounding body. What we affirm is that the property inheres in the sounding body and the quality in the body pleased.

Symphony—In modern time, or the time of representative

government, which also may be considered as the time of science par excellence, symphony has been added to music. The development of symphonic music is dependent on the development of musical instruments. Musical instruments themselves have their germ in the hunter stage of society. A tree overthrown by a tempest may be cross-cut into sections with a stone ax, reinforced by fire. Such a section may then be hollowed out with a stone adz and living coals. A vessel thus wrought serves many purposes. At night, when the tribe dances in glee, this mortar or tub for soaking skins becomes a drum. A wild gourd holding pebbles becomes a timbrel. A staff cut with notches is played upon with another and smaller one with rhythmic rasping thrum, and becomes a viol. A reed or a section of bark or the hollow bone of a bird makes a flute. A tablet two fingers wide and a span in length, suspended from a staff with sinew, becomes a roarer which is whipped through the air—the first trumpet of primitive man.

A group of such implements (and there are many others in primitive life) constitutes the first orchestra. When science comes and the nature of sound itself is understood as a property, instruments are invented and improved by the husbandry of mind until a great variety of musical instruments are developed; thus symphony grows from the soil of time. What, then, is symphony? It is a succession of melodies, every one of which is produced by a group of instruments, one of which may be that of the human voice. Now, as these instruments play in unison, one or another is selected to play the leading melody, and the other instruments are made to play subsidiary melodies in harmony with the leading melody. As the melodies pass in succession, a new theme is chosen for the leading melody, and thus there is a succession of themes.

This elementary statement seems to be necessary that we may properly understand the evolution of music and the derivative character of the pleasures which it produces; for symphonic

music is pleasing because harmonic music is pleasing, but in a higher degree; harmonic music is pleasing because melodic music is pleasing, but in a higher degree; melodic music is pleasing because rhythmic music is pleasing, but in a higher degree.

In music, as in architecture, the pleasure is developed by differentiating and integrating the elements, that is, by higher and higher organization.

GRAPHIC ART

We must now consider the nature of graphic art and its evolution through the four stages of culture which we have denominated the hunter stage, the shepherd stage, the tyrant stage, and the freedom stage.

Sculpture—Hunter man carves images of various objects in wood, shell, bone, and stone; he also molds such forms in clay. This is the first form of graphic art as discovered in ethnology, which is the science of tribal culture. Now, there is a special motive in this stage of society urging men to excellence in primitive sculpture. Much of the time of wildwood men, or men of the hunter stage, is devoted to the pursuit of religious activities. Dancing is always a religious activity with primitive men, and it is the primeval system of worship. But to this element another is added, that of representing to the gods the desires of men; for this purpose an elaborate system of representation is developed. The gods worshiped are the animals, but all things known to wildwood men are animals. The celestial bodies are animals traveling in a path along the firmament, from east to west, where they turn again to find their way underground to the east. All rocks are animals fixed to the earth by magic or scattered loosely upon the earth because, being asleep, their ghosts have departed, for that is the theory of sylvan life. Trees and smaller plants are animals fixed to the earth by necromancy. Clouds are animals, streams are animals, seas are animals, and the clouds are ever descending upon the earth and migrating by streams to the sea, for every drop of water is an animal.

This theory of animate life is universal in tribal society. In this stage, when men carve in earnest, they are engaged in producing the instruments of worship. These objects are not themselves worshiped in the true sense; they are only the emblems of worship which are displayed before the gods that they may comprehend the wishes of the worshipers. The emblems displayed upon the altar are of two kinds: first, they are the emblems of the gods worshiped; and, second, they are emblems of the good things which the worshipers desire. Thus a savage altar is adorned with the images of the gods and the emblems of the blessings for which the savage man makes request. The altar is the table on which these emblems are displayed. The things desired may be represented by images, as when game is asked or when fruits are besought. But there may be many accessory objects placed upon the holy table, as when in prayer for corn that it may ripen and become hard the thought is conveyed by fragments of crystal that lie beside it on the table. The crystal is an adjective that qualifies the corn. Savage men always believe that they have lost the language of the gods, and thus they eke out the meaning of their words by the illustrations which they assemble upon the altar. That prayer may be understood is the primitive motive for excellence in carving.

Relief—The next step in the evolution of graphic art is taken in the shepherd stage. Wildwood men etched crude pictures on rocks, or scratched them on bones, horns, bark of trees, and on the tanned skins of animals. Such etchings are mere flats; they always fail to express relief. In barbarism they are made to show a truer form, and man learns to express in painting the meaning of tints and hues as they are reflected from bodies. The motive which urges to excellence is the desire for clearer expression in altar symbolism.

Perspective—In the succeeding stage a third step is taken. Here the emblems of the altar are painted also upon temple walls; but the themes of mythology are mainly the themes of

painting, and with this same motive the master works of art are produced. All along the course of the history of painting, religious zeal is the potent motive for excellence.

This advance consists in the acquisition of perspective, when objects are placed in the painting in such manner as to show their relative position, and the three dimensions of space are recognized in the production of the work. Now conventional signs are no longer needed. In the stage anterior to this, perspective is conventional, as if a man should say, "I have painted two horses on the canvas, but this one must be considered as far away because it is put on the right side of the picture; things on the left must be considered as near by." A great many devices for conventional perspective were invented by tribal men before they acquired the concept of true perspective.

We must here call attention to an important law of demotic evolution. Growth is made usually by minute increments. Rarely indeed is there a sudden outgrowth, but the increments of development are all made by men with a genius for the activity. Such a man is a leader in the arts. A multitude is led by one, so that demotic evolution is dependent very largely for its initiative on the few which the many learn by imitation. This law is observed not only in all the esthetic arts, but it rules throughout the whole realm of human activities. But initiative through the individual becomes demotic, because the many steps in advance which leaders make as minute increments of progress are consolidated through their adoption by the many. A leader must have a following or his leadership is in vain.

Chiaroscuro—In the fourth stage of culture still another element is added to painting. This is *chiaroscuro*, or the delicate recognition in painting of the effects of light and shade in the several hues of the work. This is the highest characteristic of art as conceived by the modern painter. The artist may succeed in all else, but if he fails in this it is failure indeed. It is the difference between the artist and the artisan.

The intellectual characteristics of works of graphic art are more pronounced than those of musical art, while the emotional characteristics are less vividly expressed. A painting may be excellent, though the theme may be trivial; but a great painting must have a great theme, and the picture must be judged by its successful presentation of the theme. We cannot here stop to treat of the evolution of themes, but will reserve the subject for a future occasion. Here we will be content with the simple expression of the judgment that no great and enduring work of art can be wrought which has not also a great theme.

We must not fail to call attention to a branch of graphic art which has taken root for itself and thus become independent. I refer to the development of picture-writings for the purpose of communicating the thoughts of men to other men. The origin of alphabets in picture-writing is now an accepted conclusion of science. When graphic art was not under the dominion of the religious motive, but was impelled by utilitarian designs, it worked out a very different result, becoming more and more conventional while painting itself comes to be more and more realistic.

DRAMA

Drama constitutes the third group of fine-art activities in logical order.

Dance—Again we have to seek for primal motives in religion. Already we have affirmed that dancing is the primeval activity of pleasure. It is the first activity which has joy for its motive. The dance is deeply imbedded in the constitution of animal life. The various scientific works and essays on play which have been produced in scientific time clearly set forth this doctrine, though some phases of it are yet in controversy.

That the dance is a religious activity is revealed by a study of the lower races of mankind. Dance is a play; not imitative, but religious play. Here the play motive and the religious motive are differentiated, so that we can separate sport from drama

but religion and drama are one in their tribal life. Dancing is the first primeval expression of joy as praise, and is the fundamental element of worship.

Sacrifice—In the second stage there is found an element of religion, and hence of drama, which has its beginning in the first stage, but is fully developed only in the second. In the first stage, in order that men may express their wants, they display them either by placing the things themselves or their symbols upon the altar. In the second stage the objects desired are sacrificed. When a deity is worshiped, the things desired are poured out upon the ground as oblations, or consumed in the fire as offerings, that the ghosts of the things desired may be possessed by the ghostly deity.

When human beings are buried, whether in the earth, the air, or the fire, the same worship is accorded them and the sacrifice made at the grave. So the second stage of drama or worship is sacrificial, while there yet remains the element of praise in the dance. We are most familiar with the characteristics of this stage of the drama in the writings of Homer; however, there is a vast body of literature on the subject from other sources. The science of ethnology reveals its nature and characteristics in a manner which is clear and forcible. All the tribes which are investigated by ethnologists present examples for consideration.

Ceremony—The third stage of the drama, which is fully developed in the imperial stage, also has roots, more or less obscure, in the earlier stages; for shamans, in instructing the people in mythology, devise curious and interesting methods to enforce their teaching by representing the scenes in a more or less dramatic manner, in which the neophytes of the shamanistic order take part, and, to some extent, other members of the tribe are assistants.

This difference in the nature of the drama of tribal society and of national society must be understood. The drama is not designed as a language by which men may talk with the gods, but

it is designed as a language by which men may be instructed. In savagery, the language by which the gods are addressed is sign language; in barbarism, it is gesture speech; in monarchy, the national god is the only true god,—all others are devils,—and this true god understands and employs the national language, and religious drama is a gesture speech designed to instruct men in divine lore. This new element appears in one form in the more highly developed savage society, in another form in barbaric society, but in tyrannic society it is fully fledged as ceremony. It is shown in the account which we have of the Eleusinian mysteries; it appears also in the dramatic performance of many nations of Europe, Asia, and Africa, where the drama becomes an institution promoted and regulated by the ruler, and drama is the principal system of worship in the national religion, while local worship is restricted largely to tribal methods. This new element of worship is developed by transmuting the actual sacrifice into ceremonial sacrifice. No longer are hecatombs slain; no longer are wines poured upon the ground; no longer are cereals burned in the fire; but a ceremony representing these things is instituted and held to be sacred, and especially efficacious, while praise is not only terpsichorean as in savagery, not only athletic as in barbarism, but it is pageantry. Thus, in the tyrannic stage, we have ceremony.

Toward the close of this stage religion and drama are partially divorced, so that there is a drama more or less distinct from religion.

Histrionic Art—We have now to consider drama as an esthetic art in the fourth stage of culture. This stage is brought about as a revolution in society fundamentally through the agencies of science; not that there is no science anterior to this stage of culture, but that its power has not attained that potency necessary to the transmutation. Science is only simple knowledge, which is but a verified inference, and in all ages men have known something. A few simple facts known in savagery become germs

that develop and multiply through the centuries until science becomes a controlling element in civilization.

The time of science is marked by events, but the time of science as a stage of culture may be considered as beginning with the discovery of the new world and the invention of printing, together with scientific principles that had been developed up to that time. Research is born of the love of truth, and the truth discovered breeds more research, so the child becomes the parent that new children may be born; and when these generations have multiplied until they become a host, the multitude of scientific motives extant in the world constitute a power over society ever more and more efficacious in the regeneration of mankind.

Heretofore we have sought a motive for drama in religion; now we must seek it in the desire to truthfully express life—the life of man in society. The promoter of drama as entrepreneur or undertaker of dramatic enterprise, may have a motive of gain. The artist may have a motive of ambition, but it is soon found that these motives may be gratified to the highest degree only by a most deft expression of the truth; so the motive for evolution is now the desire to express the truth in the action which is designed to represent a trait of character, and the artist, be he dramatic writer or actor, strives to express the emotions of the scene in the most vivid and truthful manner. Columbus discovered America that Jefferson might portray *Rip Van Winkle*.

He who hath ears to hear, then let him hear
And sage become that he may come a seer.

ROMANCE

Romance is the fine art next in logical order. The first form of romance is myth. We cannot understand its nature without understanding the cosmology with which it is associated. All tribes, savage and barbaric alike, have a cosmology based on a notion of seven worlds. This notion is developed through that phase of the evolution of language which Max Müller has called

a disease. Müller's characterization, though more poetic than scientific, is yet a legitimate trope. In the evolution of language old words are used with new meanings, and often the old meanings fade while the new meanings become standard, which seems to be at variance with the etymological signification of the terms. Primitive languages absorb the entire assertion in one word; their words are holophrastic; a single word performs the offices of all the parts of speech, for parts of speech are yet undifferentiated; therefore, a word is a complete sentence. When words are sentence words, the phenomena which men attempt to describe with them are expressed in such terms that linguistic development leads to a cosmology of space.

In this manner primitive man is led to speak of seven elements of space. There are the here, the center, the midworld; the zenith, the above, the heaven world; the down, the lower world, the nadir, the hell. The apparent rising of the sun in the east and its apparent course to the west seem to divide the plane of the earth into two parts. In speaking about the east, the eastern direction, the eastern land gradually becomes an eastern world; and in speaking about the west, the western direction, the western land, it gradually becomes the western world. Then, as men must still talk about the north and the south as distinct from the east and the west, they also become worlds. Thus we have the cardinal worlds; these with the midworld, the zenith world, and the nadir world constitute the seven worlds of the cosmology of savagery.

The seven worlds are universal; every savage and every barbaric tribe recognizes and believes in them, as they are inexorably developed as notions in the mind through the power of the language used to express thought about relations of space, especially as it refers to commonplace geography. Every day the savage man has to tell of his wandering or the wanderings of others over the surface of the earth, or to give directions to others how to find places and objects, so that in this use of holophrastic terms

he unconsciously reifies the relations of space and makes them seven distinct worlds. In tribal life the notions of seven worlds are intuitive as a habit of judgment.

If a man habitually speaks of an object in terms which involve erroneous notions, the habit of forming the judgments involved becomes intuitive. Persuade him that eating parsnips on Wednesday is a taboo and may lead to bad consequences; a constant avoidance of this habit will lead him to habitual judgments of evil, and he will believe that such judgments are intuitive. It is thus that qualities are generated in the mind from the point of view of the individual.

Beast Fable—Wildwood man worships the beasts as gods. As we have already seen, he believes that all bodies have animate life; that is, he interprets the phenomena of the world from the standpoint of the belief that all bodies, like human bodies, are endowed with mind and that they have motives and enjoy pleasures and feel pains and exercise will as men do. The savage man interprets the environment of bodies as if they were human bodies. This is what has been called anthropomorphism.

With this view of the world savage man develops a vast body of story lore which reveals his thoughts of the nature of things with the causes and effects of events that constitute the history of life and change. This lore is myth. But more; by agencies which are now well recognized in science, he believes that every body has a dual existence, as gross body and attenuated body, and that the attenuated body may enter the gross body or depart from the gross body at will, and that the attenuated body may sojourn in one gross body or another at will.

The attenuated body is known in our language as ghost, but every primitive language has a name of its own, as *manitu* in the Algonquian languages, and *pokunt* in the Shoshonean languages, and *wakanda* in the Siouan languages. This ghost is held to be the cause of things. All events are caused by ghosts. Every distinct linguistic stock of the world has a body of myth consist-

ing of stories related about the doings of human beings and mythic personages, which always assume that the ghosts of the other personages influence the ghosts of men, or that the ghosts of men influence the ghosts of other personages. This is the essence of barbaric myth or romance, for myth and romance are one in this stage of culture.

Power Myth—In the second stage of myth or romance we discover a radical development in the personages of the story. A new class of deities is found. From the same linguistic cause which we have set forth, the conspicuous phenomena of nature are personified as gods. The powers of the universe as they are known in that stage of society become the heroes of myth. The animal gods remain, and with them the human beings; but all the gods of savagery are assigned minor parts, and the new gods constitute a superior order of beings.

This stage is popularly known through the writings of Max Müller and others who have devoted much time to the study of Sanskrit literature. It is set forth in the popular accounts of Norse mythology and also in Germanic mythology. Again we find it well recorded in Homer and Hesiod. In fact, there is now a large body of literature gathered from various lands which is being carefully studied for the purpose of discovering the characteristics of this stage of myth.

While romance is beast fable in savagery, romance is power myth in barbarism. To understand this transmutation we must see the change which is wrought in the concepts of worlds or in cosmology. It is a change which begins in savagery, but is more highly developed in barbarism. The concepts of space worlds control the concepts of the savage mind to such an extent that all of the attributes of bodies are referred to the worlds as properly belonging to them. Thus colors originally come to be classified as seven, for the act of expressing concepts in words is more potent than the sense of vision in controlling the judgment of the color of objects.

The prismatic colors, as such, are unrecognized; but hues, tints, shades, and even patterns are classified, and there is a tendency to classify them as hues. The scheme of colors, perhaps, differs from tribe to tribe; of this I am not sure, but this I do find among some tribes: blue is the color of the zenith, and things are said to have sky color. It is a very natural mistake for man to reach the conclusion that sky color is made by the sky or that it comes from the sky by the habit of language which already has been set forth. Color is thus reified and assigned to a world. Darkness, or black, seems to primitive man to come from below, and as darkness is reified, it is believed to come from the nadir world. Green is held to belong properly to the midworld, for it is the color of plant bodies and is seen nowhere else.

In tribal society the colors seem to be variously assigned to the cardinal worlds as hues, tints, shades, and patterns. In the cases which I have especially investigated, red belongs to the west, white to the east, yellow to the south, and gray to the north.

When the chains which hold drama to religion are dirempt and they can go forth to lead a free life, both start on new careers. Drama becomes histrionic art indeed, and the stage becomes the mirror in which are reflected the causes and consequences of the deeds of life. Religion soars on wings of aspiration into the empyrean of hope—hope for a purer and better life which bears fruit in purer and better conduct.

The germ of dramatic art is the dance, which in its first stage is religion. Of course religion must be distinguished from theology. Theology is a system of opinions, while religion is a system of worship. Religious motives become the seed of graphic motives and also the seed of musical motives. We see that both musical art and graphic art are founded on religion. We shall proceed to show that the other esthetic arts are based on religion.

The intellectual and emotional elements of drama are pretty evenly balanced in the last histrionic stage; but if we consider

its growth from the beginning I think we shall find a steady development from emotional to intellectual art.

We have yet to note that the pleasures obtained from dramatic activities are derived. There is no essential *in* nature as a distinct property on which pleasure is founded, but it is founded on the relative element of consciousness which is inference and which produces judgments. All our knowledge of the pleasures of dramatic entertainment are founded on judgments and are good or evil from the point of view which we have attained in the progress of culture. It needs but a single illustration to make this fact evident: The drama of the savage, dancing about the firelight which glints the trees of the surrounding forest, does not constitute an entertainment for which the civilized man longs and which he would sedulously promote. That which brings gladness in one stage, brings contempt in another. True, the ethnologist may be delighted to witness the wildwood scene and even to engage in its revelry; but his purpose would be not to dance for joy, but to dance for knowledge.

In a similar manner which we cannot stop to explain fully, all the attributes of bodies as properties or qualities are assigned to regions by wildwood men and shepherd men. The increasing knowledge of the world leads to a geographical knowledge of immense distances on the horizontal plane of the earth as it is then supposed to be; but the cardinal attributes still remain to be grouped about the one which seems to be the most conspicuous.

A survival of this classification of attributes in world schemes still remains in modern time when attributes of good are assigned to a world of space, as the heaven above, and attributes of evil are assigned to the world below—hell.

The attributes which were assigned to the cardinal worlds are grouped about the most conspicuous attribute, as the cardinal worlds are abandoned owing to an increasing knowledge of geography. Finally, they settle down into four elements: the cardinal worlds thus become elements—earth, air, fire, and water—and the

bodies of the worlds are believed to be composed of these elements in varying proportions.

In Greek and Roman classics we find much about these four elements; but the development of four elements out of four worlds belongs largely to barbarism, though perhaps it is not fully completed until the stage of monarchy is reached.

Necromancy—In the monarchical stage of society the four elements—earth, air, fire, and water—play a very important role. It is now the theory that bodies are composed of these elements, and it is a theory that the difference between bodies depends on the different proportions of these elements which they severally present. The cardinal worlds thus become cardinal elements, and a birthmark remains when they are put in antithetic pairs. Earth is opposed to air, and fire is opposed to water. This stage of society is the stage of alchemy in the philosophy of bodies. The wondrous transmutations that appear in nature are explained as alchemical changes in combining or freeing the elements. The stories now invented are stories of necromancy in which theories of ghosts and theories of alchemy are compounded. This is also the age of chivalry, and the stories told are tales of wars and wiles, and the heroes are kings, warriors, wizards, dwarfs, giants, and demons. They often wander about the world for the purpose of adventure or because they are engaged in wonderful enterprises. *Thaumaturgy*—not natural wonders, but invented wonders—now constitutes the principal theme of romance. Myth is transmuted into romance.

The three worlds remain as earth, hell, and heaven. We cannot stop to catalogue these medieval romances, but they constitute an extensive literature in themselves and there is an extensive body of literature about them. Often in the next stage they become the themes of poetry. The Victorian bard has used some of these medieval themes in the *Idylls of the King*.

Novels—It must constantly be borne in mind that romance in

its various stages may have themes to a greater or less extent the same throughout, but that they differ in the method of treatment. Beast fables may yet be told, but merely as fables to teach a lesson. The nature myths may yet be used as illustrations and embellishments, and romances may yet be written with all the thaumaturgy of the middle ages to give literary amusement to people who are not supposed to believe in necromancy.

With this warning we may go on to describe the romance of the last stage. To the world's store of romance new tales are added—fictitious histories in a series of events where causes conspire to produce effects that have an intellectual and emotional interest. In an especial manner modern tales are designed to teach a lesson of good and evil, and there are many romances that are doctrinaire in motive.

This is the transmutation brought by science upon the characteristics of romance. Tales are no longer told to be believed, but are told to teach lessons. Romance is fundamentally designed to give pleasure, but at the same time is made to teach wisdom in conduct. If the potion is but a coated pill, the medicine is refused; but if a dram of moral truth is deftly mixed with a pound of delightful representation of men and things, the moral becomes a luxury.

POETRY

The fifth in order of the fine arts is poetry. All of the esthetic arts are activities designed to produce pleasure. This is their fundamental purpose. Poetry is an art of pleasure. Its fundamental purpose must be pleasure, although it sometimes may be a good method of presenting the truth; in fact it often serves this purpose in an admirable manner, but its philosophy must be veiled whether it be intellectual or moral wisdom.

That which makes poetry is the method of expression that is adopted by poetry. In music the method of expression is rhythmic sound and the combinations of rhythmic sound which

appear also in melody, harmony, and symphony. Graphic art is expression of form which at first gives us form as molded in sculpture, then form as relief, then the combination of form in perspective, and finally the delicate expression of forms in values or chiaroscuro. In drama we have an art which employs gesture speech as its mode of expression. Its root is the dance, and the first stage of the drama is terpsichorean; its second stage is sacrificial, its third stage is ceremonial, its fourth stage is histrionic. Romance is expression by fictitious history. It appears first as beast fable, then as power myth, then as necromantic tale, and finally in the novel.

In poetry the method of expression is metaphor. We are yet to see the stages through which metaphor is developed. Again I must remind my reader that all of these stages have roots in the primitive stage, that they develop by minute increments, and that a characteristic of poetry is never developed in full panoply of action.

Personification—Personification is the germ of poetic expression. Personification is the fundamental error in the philosophy of savagery. Tylor called this belief animism; already we have set forth its nature. It arises from the mental necessity of making judgments and comparing them with the inferences which the mind draws from sense impressions. The savage interprets the world of bodies in the environment from the concepts of human bodies. From the standpoint of psychology this is anthropomorphism, while from the standpoint of philosophy it is animism. This animism or anthropomorphism is personification from the standpoint of poetry.

Wildwood man is of the opinion that all bodies are animate and that all the tribes of the lower animals, and all the tribes of stars, and all the tribes of clouds and streams, and all the tribes of plants, and all the tribes of stones are tribes composed of clans like his own. The philosophy of savagery is the essence of poetry, but before it is recognized as such it must undergo won-

drous development. This philosophy must first become a religion before it is etherealized as trope, which is the essence of modern poetry.

In the earliest poetry holophrastic words are used as nouns or substantives with adjectives of quality in exclamatory sentences (remember the distinction between qualities and properties) to mark the time of a complement of steps in the dance of worship. In every clan or tribe in this stage of society there is a leader who is the master of the dance and who regulates it with rhythmic chant in which others may take part, when the solo of the shaman becomes the chorus of the people. The exuberance of dance and the inspiration of shout unite to produce emotion—wildly hilarious if it is a dance of praise, wildly vengeful if it is a dance of war, wildly wailing if it is a dance of mourning for the dead. Thus is produced an ecstasy of joy or hate or sorrow.

In the exclamatory phrases of song are named the personified objects that are supposed to be inspired with motives like those of men, and hence the adjective element of the song expresses the good or evil which is the theme of poetry. The earliest poetry in this manner involves a double expression, one of personification and another of qualification.

Similitude—In the second stage powers are personified as if they were bodies, and there is developed a new class of deities which are supposed to be superior to the old gods, and the old gods are called demons; not yet devils, mind you, but only demons. Now, there are many kinds of these demons, as elves, fairies, muses, sirens, and what not, while human beings are sometimes giants and pigmies. This is pertinent to the present exposition. Personification in this stage is the creation of invisible bodies out of pure forces that are supposed to exist independent of bodies: that is, properties can exist in some invisible state like that of ghosts. Man personifies not only bodies, but he also personifies qualities.

In this stage qualification is developed into similitude. That

which is affirmed by the adjective element as great or small, as strong or weak, as beautiful or ugly, or any attribute expressed by a qualifying adjective, is reënforced by a poetic similitude. The attribute or the person acting in a specified capacity is always like something else, and the poetry in this stage is filled with elaborately developed similitudes. The best illustrations of this characteristic of poetry are found in Homer, but they may be found in all the poetry of the upper stage of tribal society. Opening at random a copy of Bryant's *Odyssey*, on the first page I chance to see I find this passage:

. . . for sure
I never looked on one of mortal race,
Woman or man, like thee, and as I gaze
I wonder. Like to thee I saw of late,
In Delos, a young palm-tree growing up
Beside Apollo's altar; for I sailed
To Delos, with much people following me,
On a disastrous voyage. Long I gazed
Upon it wonder-struck, as I am now,—
For never from the earth so fair a tree
Had sprung. So marvel I, and am amazed
At thee, O lady, and in awe forbear
To clasp thy knees.

In this stage of poetry qualification is used as a poetic element as in the first; then qualities are personified as well as bodies, and qualification is reënforced by similitude.

Allegory—In the third stage of society certain world attributes are explained as world elements: these are earth, air, fire, and water, and the proportion of these elements in bodies of the earth gives rise to their attributes. In philosophy this is alchemy; but it is only the alchemy of bodies, while the ghosts are psychic beings and only psychic attributes are personified.

A gulf now exists between ghost and body. The ghost is spirit or essence, something which can be distilled and which may pervade space like an aroma, or itself be wholly spaceless and hence formless. It may occupy any point of time present,

past, or future, for it is timeless; hence it is the ghost of memory and prophecy. But the body is now gross matter—dead and subject to the manipulations of alchemy. With the development of personification and differentiation in theory between ghost and body there comes a development of similitude into something else; this we must now set forth.

The similitude is now elaborated into the foundation of an allegory upon which is erected an edifice of doctrine, or, if you will allow another illustration, the similitude becomes a warp into which a woof is woven with patterns which constitute a tapestry of doctrine.

I know of no better way of setting forth the nature of allegory than by directing the attention of the reader to Spenser's *Faerie Queene*, in which he will find an allegory of allegories—a grand allegory made up of many adjuvant allegories. Six books of one allegory are composed, every one, of twelve allegories. The principal characters of the grand allegory are personified qualities. In the first book holiness is personified as "St. John the Red Crosse Knight"; in the second book temperance is personified as Sir Guyon; in the third book chastity is personified as Britomartis; in the fourth book friendship is personified in Cambel and Triamond; in the fifth book justice is personified in Artegall; in the sixth book courtesy is personified in Calidore; and throughout the poems many other qualities of good and evil are personified. These personifications are the heroes of a succession of necromantic tales relieved by many wild adventures.

The literature of romance and poetry alike which belongs to this stage of culture is very abundant, and I need but mention another instance or two to make it clear to the reader. Bunyan's *Pilgrim's Progress*, Dante's *Divine Comedy*, and Milton's *Paradise Lost* are excellent examples.

Trope—In the fourth stage of culture chemistry has supplanted alchemy, medicine has supplanted sorcery, astronomy has supplanted astrology, and science has supplanted cosmology.

All kinds of personifications appear, but in a new light with a distinct cognition that personification is poetic. All kinds of personification thus become tropes, and mind itself is clearly understood to belong only to animate beings. Qualification, similitude, and allegory still remain with a more or less clear cognition that qualities are but qualities, similitudes are but similitudes, and allegories are but allegories, and that they are legitimate only as metaphors and constitute only a poetical method of expression through which the wisdom of science may be expressed in such manner as to impress them deeply upon the heart. Trope, therefore, is the last and greatest acquisition to poetical art. Romance is poetry without rhythm. Poetry is romance with rhythm, but there is added to it a much higher element of metaphor—the special method of poetic expression.

There has grown up in the history of poetry a recognition of four classes of poetry, namely, the lyric, the epic, the dramatic, and the idyllic. These names pretty well express the characteristics of the four kinds of poetry herein enumerated. If poetry is to be classified under these terms, they require both some restriction and enlargement in their limits. Lyric poetry is pretty well defined when we call it song poetry. Epic poetry is pretty well defined when we call it similitude poetry; but many poems which have sometimes been called epics are excluded. Dramatic poetry is not well defined as allegoric poetry if it is held to mean that poetry which is constructed as dialogue; but it is well defined if we understand it as that poetry whose principal element is dramatic, for then it will be seen that every dramatic poem is an allegory of good and evil. Idyllic poetry is well characterized as poetry whose chief element of expression inheres in trope. Read again the *Idylls of the King* for the purpose of seeing how their dramatic characteristics are subordinated to tropical expression, and I think you will conceive that Tennyson was right in characterizing them as the *Idylls of the King* rather than as the *Allegories of the King*.

There is a fact in history that here must be considered in order that we may not obtain an erroneous opinion about the argument set forth in this essay. The Roman and Hellenic peoples expanded prematurely into a degree of culture more than two thousand years ago, in classical times. The political institutions which they developed at that time, because they contained an element of hereditary rank and especially an element of slavery, did not furnish an enduring foundation to the highest culture of the age. History now proves that many of the elements of culture to which classical times had attained as a blossom of fine arts, were not sufficiently rooted in a soil of free institutions. That classical culture might firmly be founded, a greater liberty had yet to be given to men, and that there might be greater liberty there yet had to be greater scientific knowledge. So the superstitions of the dark ages constituted but a cloud under which mankind labored while it laid the foundations of representative government.

We need not review the history of poetry to show how its elements have been developed; manifestly all that is good or bad is derivative; all of the esthetic arts are found to be derivative.

Pleasures and pains arise from judgments, and do not arise from consciousness but from inference. All of the phenomena of pleasure and pain arise in the mind through the point of view; they are therefore qualities and not properties. All matter is not endowed with mind, but all matter is endowed with consciousness. The relative element is choice, which becomes inference in the formation of judgments. There can be no mind until there are organs of mind. Until this condition arises in the development of animate life there is no mind, but when it does arise this mind makes judgments. As the judgments are inferences only, until they are verified, there is no cognition until there is verification, and the cognition of pleasure or pain is reached only by inference and verification. This is what we have intended to express by saying that pleasure and pain are derivative.

THE CALCHAQUI: AN ARCHEOLOGICAL PROBLEM¹

By DANIEL G. BRINTON

The titles given below name but a small fraction of the articles and works which have appeared in the last decade on the ancient tribes of the Calchaqui and the archeology of the area they inhabited.

This fervor of investigation is fully justified by the importance of the questions to be settled. They rank among the first in the palethnology of the South American continent. Nowhere else east of the Andes are found remains of a culture rivaling that of Peru, and rising distinctly into that of the Age of Metals.

What relations did this culture bear to that of the Aymara and Quichua? Was it the child or the parent of the latter? Or does it reveal an independent center of civilization? What were the ethnic and linguistic affiliations of the people who occupied that area at the time of the conquest, and were they the authors of that culture?

These are the inquiries which for years have been engaging the attention of the leading antiquaries in Argentina, and it is my intention at present very briefly to state the conclusions to which they have arrived.

A few descriptive words will not be amiss. The ancient province of Tucumán, of the once viceroyalty of Buenos Aires, lay at

¹ *Calchaquí*. Por Adán Quiroga. Pp. 492, and app., pp. xxvi. Illustrated. Tucumán, 1897. Vol. 1.

Notas de Arqueología Calchaquí. Con dibujos. Por J. B. Ambrosetti. *Boletín del Instituto Geográfico Argentino*, 1896, 1897.

Die Calchaquis. Von Dr. H. von Ihering. *Das Ausland*, Jahr, LXIV, Nos. 48, 49.

Las Ruinas de Watungasta. *Las Ruinas de la Fortaleza de Pucará*. Por Guarnido Lange. *Anales del Museo de la Plata*, Sección de Arqueología, 1892, etc.

Tesoro de Catamarqueñismos. Por S. A. Lafone Quevedo. *Anales de la Sociedad Científica Argentina*, Tom. XXXIX.

the foot of the Andes, amid the upper feeders of the Rio Dulce and Rio Salado, between south latitude 26° and 29° and west longitude 63° to 66° , and thereabout. The most interesting portion of this region, archeologically, is that known as Catamarca, which includes the valleys of Yocavil, Famaifil, Andalgala, and others. Here are situated the remarkable fortress of Watungasta with its stone walls and cylindrical brick towers; the extraordinary fortified camp of El Pucará, 23 kilometers long and 9 wide, with stone walls 3 meters in height, flanked by circular redoubts with interior banquettes; the majestic remains of the Cerro Pintado; of the Punta de Balasto; and many others. For scores of leagues the soil yields abundant testimony of a dense and advanced ancient population. Foundations of stone and brick walls, fragments of neatly turned painted pottery, cemeteries where the dead were interred in large jars; stone axes, and other stone and bone implements; bells and ornaments of copper, needles of silver, chisels and plaques of bronze, numberless images, idols and amulets of stone, terra cotta, hardwood, and metal, rows of monolithic menhirs recalling those of Brittany, strange figures carved or painted on the flat surface of rocks, —these abounding vestiges of a vanished people still mutely testify to a progress in the arts and a development of social condition scarcely if at all surpassed anywhere on the continent of America by its indigenous inhabitants.

What do we know of these people by history or tradition? That fountain of legendary lore, Garcilasso de la Vega, tells us that they voluntarily submitted themselves to the rule of the Incas,¹ and von Ihering places the date of the occurrence about 1300 A. D. Tucumán thus became part of the Incasic province of Colla Suyu. Certain it is that the Spaniards, exploring the country in 1536 and later, found the Quichua tongue understood everywhere by the chieftains, although not by the common herd.

At that date the vales of Catamarca were inhabited by those

¹ *Comentarios Reales*, lib. v., cap. xxv.

whom the chroniclers call Calchaqui, which is apparently the Quichua '*kallchay-cuy*, "irascible, ill-natured," a signification very suitable to these natives, for their wars and revolutions continued with little intermission until they were finally exterminated in 1664.

A double question here arises: What was the affiliation of these Calchaqui? And were they the builders of the great structures of Catamarca and the begetters of its civilization?

It must be said that no satisfactory answer has yet been given to the first of these inquiries. We have, in fact, no positive relics of the language of the Calchaqui; not a word. I say this with full knowledge of the analyses of local names by Lafone Quevedo, Quiroga, and others. The latter concludes that they spoke the tongue called by the missionaries "Cacana," and that this was related either to the Araucanian or to the Guaycuru dialects of the Chaco. The industrious student Florentino Ameghino¹ argues from certain evidence that their tongue was a dialect of the Aymara; von Tschudi maintained that it was related to the modern Atacameño of the Pacific coast; while Dr. Th. Waitz set it down as a corrupt dialect of the Quichua. Such wide divergence among competent scholars proves only that the material is wanting to decide the question.

After all, it is of less interest than it would be, if we were to consider the Calchaqui as the exponents of the ancient culture. But of this there are grave doubts. The earliest explorers nowhere report them as a civilized people, and describe the land as filled with ruins when first visited. Therefore, von Ihering, Quiroga, and other archeologists incline to believe that the civilized builders of these remains had been overcome and dispossessed by wild and savage tribes long before the whites reached the region, very much as the mound builders of the Ohio valley had also succumbed to the inroads of barbarians, and fled or were exterminated.

All the archeologists agree in one point, and it has been es-

¹ *Antigüedad del Hombre en La Plata*; tom. II., cap. XIII.

pecially emphasized by Ambrosetti—the Catamarcan remains are throughout Incaic, in design, technique, and symbolism. Of this identity of inspiration there can be no question, and it has been shown in a hundred details. We must, therefore, decide whether this was an extension of Incaic culture beyond the jurisdiction of Incaic rule; was it that of a portion of the Incaic state; or, as von Ihering boldly suggests, do we find in the vales of Catamarca the very source and birthplace of the Incaic culture itself?

These questions are still open. The vast collections in the Museo de la Plata, the researches in craniography by ten Kate, in linguistics by Quevedo, and in symbolism by Ambrosetti, are not yet sufficient to sustain either opinion. Much has been hoped from a comparison of the petroglyphs, and both Moreno and von Ihering have ventured boldly in the identification and interpretation of these rude markings. But nothing convincing has resulted from the similarities they point out; such recur between these inchoate designs everywhere.

That the religious ideas expressed in the symbolism of the remains of sacred art in the Catamarcan valleys are strikingly similar to those of the Incaic faith is a strong point which has been well brought out by Ambrosetti. The serpent symbol is expressed in identical technical form; the costumes of gods are often alike; the *huacangui*, or love charms, are the same; the Peruvian trinity, *tangatanga*, recurs in Catamarcan wood-carving, and the curious old man with the long beard (un-Indian as he seems) appears on vases from the Calchaqui region as well as in the legendary figure of Viracocha.

All this forcibly impels to the conviction that the Catamarcan culture was essentially Incaic, but that it had already passed to degeneration and destruction before the arrival of the whites, and that the nations these found in the picturesque valleys of Tucumán were not the builders but the destroyers of the ancient glory of the region.

ABORIGINAL AMERICAN ZOÖTECHNY

By OTIS TUFTON MASON

INTRODUCTION

PLACE OF ZOÖTECHNY IN A GENERAL SCHEME OF ACTIVITIES

The activities of man are divided into classes according to the department of nature in which they take place; to wit, exploitation of the forces of nature; the invention of mechanical devices for the domestication and use of these forces; the activities associated with the mineral kingdom, with the vegetal kingdom, with the animal kingdom, and with the human species. All industries associated with the animal kingdom are included in the general term zoötechny.

AMERICA'S PLACE IN ZOÖTECHNY

In all times and places the human species has been intimately associated with animal life to obtain food, clothing, shelter, and material for its arts. The American continent, before its discovery by the whites, was inhabited by a subdivision of mankind that occupied the lower and middle stages of human culture. In a general way, therefore, the study of zoötechny in this area will make plain the same kinds of activities as those which existed in other parts of the world from the beginning of human life on the globe. Aboriginal American zoötechny embraces every phase of Indian life growing out of the connection between man and the beasts of the western hemisphere in precolumbian times.

A thorough prosecution of this study is very much embarrassed by intrusions from the eastern hemisphere in historic times. Omitting all inquiries with reference to the origin of arts on this continent, there is no doubt that in every part of America, from

the very earliest intrusion, the activities of the aborigines were changed and accultured from abroad. These influences on the Atlantic side were by Scandinavians; by English and French in Canada and the United States; and by the French, Spanish, and Portuguese in Middle and South America. On the western side the Russians, in the northern parts, brought not only the arts of Siberia and of the uncultured elements in Russian population; but, having been engaged in traffic throughout the Pacific ocean and having used the Sandwich islands as headquarters for much of their trade, abundant evidences exist of their contact, not only with the Eskimo, but with the Indians of southeastern Alaska. It shows itself in the Polynesian motives on Eskimo carvings and in tools which are evidently of Polynesian origin.

In western United States and throughout the entire Pacific area of Latin America there was constant contact, through the Mexicans, with the colonies of Spain in southwestern Asia and the contiguous islands. Furthermore, when it is remembered that in southern Spain there was an agglomeration of Phenician, Jewish, Arabian, Egyptian, and north African cultures, and that great numbers of Africans were early brought to this continent and mingled with the Indian populations, there is no wonder that the student of technology is constantly at his wits' end to know whether like inventions have been independently worked out, or whether they had a common source. There is no space in this brief paper to discuss this subject, but it is capable of indefinite expansion.

ZOÏTECHNIC PROVINCES

The industries of the American aborigines, in connection with the animal life of the hemisphere, may be divided into zoïtechnic provinces.

In a paper published in the Smithsonian Report for 1895, under the title *Influence of Environment upon Human Activities and Arts*, an attempt is made to separate North America and South America into eighteen environmental areas with

reference to all of the activities of industrial life. It will interest the reader to note the close connection between zoölogic areas and Indian stock areas. Indeed, Merriam proposes to include the tribes of men among the animal species predominant in his groupings. For instance, his list for the Arctic is as follows:

A.—Exclusively Arctic

Eskimo	<i>Homo</i>
Polar bear	<i>Thalarchos maritimus</i>
Barren ground bear	<i>Ursus richardsoni</i>
Muskox	<i>Ovibos moschatus</i>
Barren ground caribou	<i>Rangifer groenlandicus</i>
Arctic fox	<i>Vulpes lagopus</i>
Arctic hare	<i>Lepus glacialis</i>
Lemming	<i>Myodes obensis</i>
Lemming	<i>Cuniculus torquatus</i>
Arctic red-back mouse	<i>Evotomys rutilus</i>
Parry's spermophile	<i>Spermophilus impetra</i>

B.—Common to Arctic and Hudsonian

Wolverine	<i>Gulo luscus</i>
Gray wolf	<i>Canis griseus</i>
Ermine	<i>Putorius erminea</i>

It is not difficult to understand how this came about. Where an animal becomes so necessary to a people that all their activities are in reference to it, they will not wander far away from it; their thoughts will be suggested by it, and even their totems refer to it. If by some stress a tribe of another stock be driven into the area, they drop their old habits and become assimilated to the region.

A good illustration of this is furnished by a story once told by Major Powell, concerning an Indian guide whom he had employed in the mountain regions of northern California. They tramped together for a long time until at last the Indian sat down and refused to go farther. When the distinguished traveler inquired the reason, it was a long while before he got an answer; but finally the Indian said that he had not seen a rabbit for some

hours. The Major had the sagacity to tell the Indian that he also had noticed the absence of the rabbit and proposed to go back, which the guide was only too ready to do.

Jacob Bærgert said of the Indians on the California peninsula: "All of these petty nations or tribes have their own countries, of which they are more enamored than other people of theirs."

From the point of view here assumed these areas may be characterized as follows:

Zoötechnic Areas	Peoples	Predominant Animals
1. Arctic	Eskimo	White bear, muskox, lemming, marine mammals.
2. Canadian	Athapaskan	Reindeer, fox, wolf, and other fur-bearing animals.
3. Atlantic slope	Algonquian	Beaver, bear, deer, fox, turkey, fish, mollusks.
4. Louisiana or Gulf	Muskogean	Bear, deer, migratory birds, and gulf-fishes.
5. Plains of the Great West	Siouan	Buffalo, bear, deer, and prairie dog.
6. Southeastern Alaska	Haida-Tlinkit	Otter, pelagic fish, and aquatic mammals.
7. Columbian region	Salish-Chinook	Mixed aquatic and land animals, wild goat and sheep.
8. Interior basin	Shoshonean	Elk, antelope, rabbit, wolf.
9. Californian region	Very mixed stocks	Inland fish, elk, rabbit.
10. Pueblo region	Tanoan-Tewan and Sonoran	Coyote, mountain lion, and rabbit.
11. Middle America	Aztec-Maya	Lizard (iguana), subtropical animals, and peccary.
12. Antillean region	Arawak-Carib	Rodents, tropical birds, manatee, marine animals, turtles.
13. Cordilleran region	Chibcha-Kechua	Llama, chinchilla.
14. Upper Amazonian region	Jivaro, Peba, Puno, etc.	Birds of beautiful plumage, monkeys, river products.
15. Eastern Brazilian region	Tupi-Guarani, Tapuya	Monkeys, agouti, peccary, tapir, sloth, turtles, fish, mollusks.
16. Mato Grosso and southward	Mixed peoples of Brazilian and Andean types	Monkeys, agouti, peccary, tapir, inland fish, mollusks.
17. Argentina-Patagonian region	Chaco, Pampean, and Patagonian stocks	Vicuña, rhea or American ostrich.
18. Fuegian region	Aliculaf, Ona, and Yahgan	Mollusks and other marine products, formerly seal.

The region gives character to the activity, not only by the species of animals predominating there, but by the abundance or scarcity the year round or at certain seasons.

Coville¹ says: "To a traveler passing across our southwestern desert region it is a matter of great wonder how the Indians of that country contrive to subsist. The question is not what furnishes the best food, but what will furnish us any food."

On the upper Ucayale the savage has not been able to compete with the terrible forces of nature. Animal life is not plentiful, fish are not abundant in the streams, and the power of the native to penetrate the forests is limited owing to the tangled mass of undergrowth.²

The same story, only in a different element, would be told by the Fuegians, who, having exhausted the food supply of one cove or inlet, are compelled to go across an intervening bluff to reach the next source of food. For this purpose they have invented a canoe of bark which can be taken to pieces and transported over the mountain on the backs of men and put together again at the next inlet. On the contrary, there were areas in Arctic America, in Bering sea, on the Pacific coast, in the rivers of southern United States, in the Antilles, and on the Amazon, where food was so abundant at certain seasons that the natives were content to live "from hand to mouth." In such cases the great abundance would be an impediment to the inventive faculty, and in the procuring of such supplies the natives did not practice their greatest ingenuity.

DIVISIONS OF ZOÖTECHNY

The study of zoötechny will include the following chapters: I, American Indian zoölogy, or ethnozoölogy in America. II, Exploitive zoötechny—the activities associated with the capture and domestication of animals. III, Elaborative zoötechny—the activities practiced on the animal after capture. IV, Ultimate products of zoötechny and their relation to human happiness. V, Social organizations and coöperations. VI, The progress of

¹ *American Anthropologist*, vol. V, p. 351.

² Church, in *Proc. Roy. Geog. Soc.*, London, 1892, vol. XIV, p. 397.

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knowledge in zoötechny, including the growth of language. VII, Religion and the animal kingdom.

I. AMERICAN INDIAN ZOÖLOGY

In one form or another the entire fauna of each region directly or indirectly enters into the life and thought of its peoples. There are desolate places where it requires the coöperation of all the animals to keep the population alive; also there are idiosyncrasies of men in relation to animals that have no ethnic significance. It is not designed here to make such a wide inclusion. As there are creatures innumerable which are not amenable to domestication, there are also hosts of them which do not even come into general notice. It is not here concerned with what this or that man ate or wore, but in each tribe with what they all busied themselves habitually. The naturalist, on this count, would enumerate, for each area, a long list of invertebrate creatures, of fishes, reptiles, birds, and mammals; but the Indian would not go above a hundred species, and could count his chosen friends on his fingers and toes. It is this favored few, everywhere, that contribute the material for the study of zoötechny. If possible, the zoölogy of the region as it is recounted by the savage should be worked out. Finally, there are certain animals, such as foxes, wolves, and bears in North America, and the puma in South America, which wander over entire continents as freely as man himself.

The Smithsonian Report for 1887 (pp. 452-454) gives an extensive list of the animals which enter into the industrial life of the Eskimo in Greenland. The Labrador tribes subsist on the reindeer, porcupine, goose, duck, ptarmigan, and hare; they procure fur from the marten, mink, beaver, muskrat, lynx, wolverine, wolf, fox, and bear (Turner).

At Point Barrow, Murdoch studied the animals which were the natural resources of Eskimo art in that region.¹ Bishop

¹ *Ninth Ann. Rep. Bureau of Ethnology*, 1887-88, p. 55.

Bompas details the animals hunted by the inland tribes of Alaska and Arctic America.¹ A list of the food fishes of all the Alaskan Eskimo is given by Bean,² who says that every grown male native of Alaska is a fisherman. "Women and children help to increase the stores for winter, taking away great strings of salmon caught in the seines." The standard food fishes of the northern Pacific coast are salmon, herring, candle-fish, cod, and halibut; but these are supplemented for various purposes by a number of other animals.

In northwestern Canada, according to Whitney,³ the Chipewaiian have abundance of fish in the rivers; on the river banks, fisher, otter, mink, beaver, and muskrat; and in the forest, moose, caribou, bear, mink, fox, wolf, wolverine, marten, ermine, and rabbit; in the spring and autumn, migratory birds. George Gibbs⁴ furnishes a list of the foods of the people of British Columbia, Vancouver island, and the Straits of Fuca. They do not differ materially from those farther north. Lucien Carr⁵ has gathered accounts of game formerly taken by the tribes in Virginia and other southern states. This paper is an exhaustive resume of the bibliography relating to this subject. An excellent account of the animal life with which the Indians of Guiana and Venezuela were familiar is given by Everard F. im Thurn.⁶

The Yahgans of Tierra del Fuego hunt and fish; their animals are principally sea birds, otter, seal, and whales, besides a number of marine invertebrates (*Hyades*). Old voyagers speak of the abundance of seal and other sea mammals about Tierra del Fuego. The destruction of this animal food supply is post-columbian.

¹ *Northern Lights*, London, p. 182.

² *The Fisheries and Fishery Industries of the United States*, Washington, 1887, pp. 101-102.

³ *Harper's Magazine*, 1896, p. 360.

⁴ *Contributions to North American Ethnology*, vol. 1, p. 195.

⁵ *Proceedings of the American Antiquarian Society*, vol. x, p. 184.

⁶ *Among the Indians of Guiana*, London, 1883.

A careful study of this wholesale destruction of animal life goes far to explain how, with such meager apparatus of stone and wood and animal integuments, the savage could live; it further explains the later migrations of tribes to regions far away from their priscan homes. Like the lonesome guide of Major Powell, they missed their totemic friends and were driven to seek new ones.

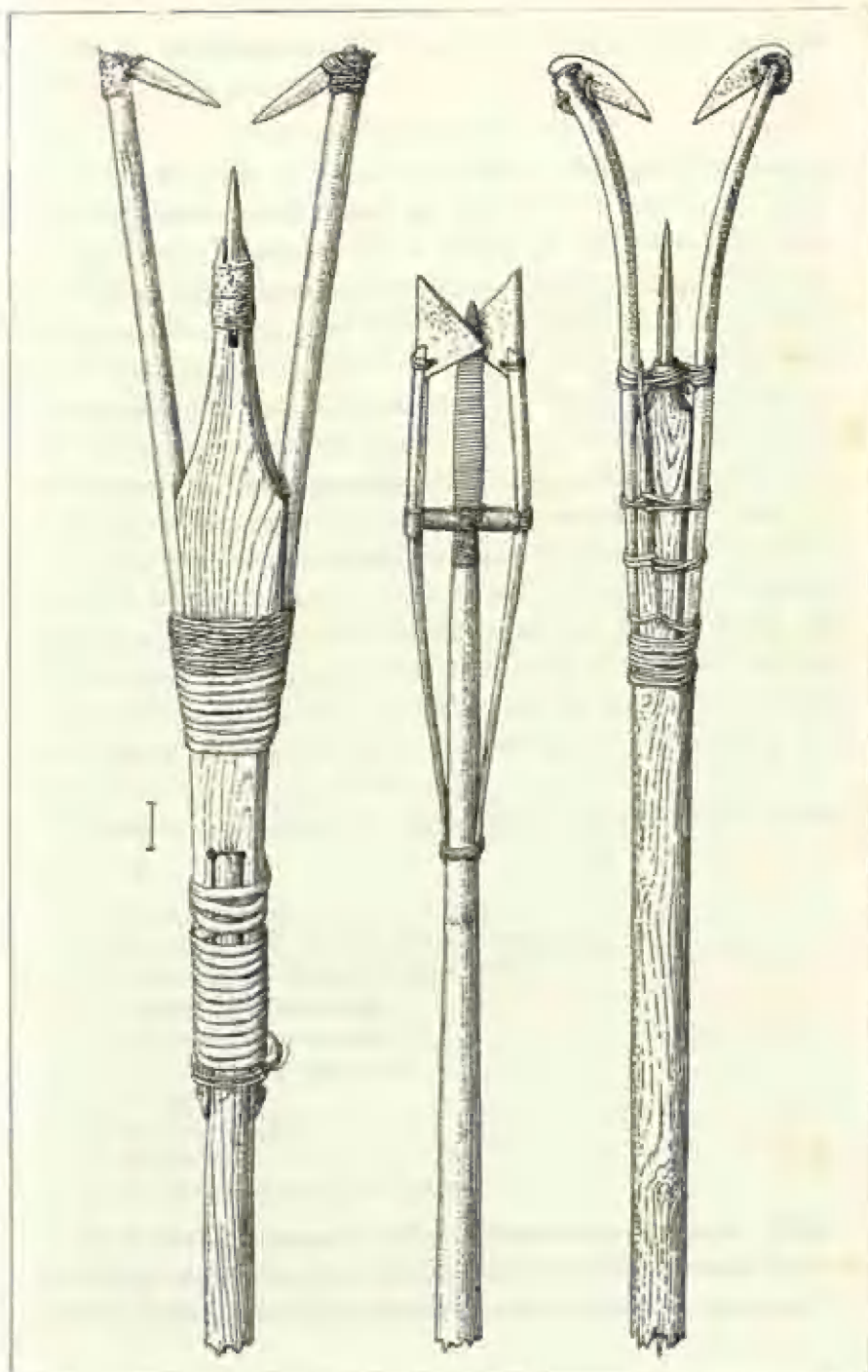
II. THE CAPTURE OF ANIMALS

METHODS OF CAPTURE

The taking of animals from the hand of nature concerns itself with the atmosphere, the earth, and the waters, and the occupations associated therewith go by the general names birding or fowling, hunting, and fishing. These terms are not to be interpreted here except in the most general way. So little is done by savage people in the way of gathering animals from the air, that this chapter will be concerned largely with terrestrial and aquatic capture. The industries associated with capture begin with very simple methods and end with most complicated practices, and in a general way they may be set forth in the following order:—

1. Gathering or taking with the hand without implements.
2. Gathering with devices.
3. Striking, stunning, bruising.
4. Slashing with edged weapons.
5. Piercing with a great variety of implements.
6. Taking in traps and blinds.
7. By means of dogs or other hunting animals.
8. With fire.
9. By means of drugs.
10. The whole class of accessories to the hunter.
11. Domestication, the raising of animals in captivity.

The progress of invention, which is the main idea here involved, has proceeded in every class from what Professor Rouleaux calls naturism to manganism, from simplicity to complexity, from individual effort to coöperation, from hand-worked devices to those mechanically and automatically worked, and frequently



LEISTERS: COMBINATION STRUCTURE FOR GRASPING, PIERCING, AND RETRIEVING, FROM ALASKA

National Museum, Nos. 23,518, 29,864, and 49,051. Collected by Swan, Turner, and Nelson

results in the compounding of several mechanisms or methods into one. (See plate I.)

THE FIRST METHOD OF CAPTURE

In all the areas mentioned the simplest and easiest method of obtaining animals and animal products is with the hand. In all of them there is some form of animal life or production which the Indian might have by simply reaching forth to take it in the same way that he gathers the fruits of plants, frequently eating forthwith what he has obtained. Indeed, many of these methods of harvesting animal life have been prolonged into civilization. We are accustomed every day to eat or to utilize, in some way, molluscan life, to hunt cochineal, bird eggs, turtle eggs, and other materials, which have been procured by simply taking them up. From this most simple operation, which is practiced in common with our friends the animals, the taking by hand passes through a series of operations which become more and more difficult and require greater and greater skill. All parts of the body are laid under tribute. The man cannot fly, but he must learn to run, climb, swim, dive, go stealthily, becoming the apt pupil of the natural pedagogs, the animals.

These operations may be arranged in some such series as the following :

1. Taking up and using on the spot.
2. Gathering and carrying away to consume.
3. Selecting and differentiating for use.
4. Pursuing and capturing.
5. Climbing and capturing.
6. Swimming and capturing.
7. Diving.
8. Stealing upon.
9. Deceiving.
10. Maiming and killing in capture.

In all of these methods skill and prowess are required. Much knowledge concerning the mental processes of the animals themselves is attained, but this will be discussed in a future section.

Among the Eskimo of Hudson bay, Captain Spicer saw a man catching by the flippers a full-grown seal as the latter was escaping into the water. The seal caught its forelimbs over the edge of the ice so that the Eskimo could not draw it back. The hunter, however, turned the seal quickly on its back, dragged it to the shore, and dispatched it in a trice.

Dr Boas saw the Eskimo of Baffinland building a flat snow-house for the purpose of catching gulls. One block of the roof was translucent, permitting the hunter inside to push his hand through, and when the bird alighted he had only to seize it and pull it through by the feet. The very same process is described by Stephen Powers: In northern California the top of the blind is a brush, to which a dead bird is fastened. As soon as a hawk alighted it was dragged through the brush and his breast crushed between the knees of the hunter.

The Eskimo of Cumberland gulf trample down the houses in which the young seal are born and drag them forth, crushing them to death.

Both the Aleutian islanders and the Fuegians feed on the echinus, or sea urchins, inside of which lie leaf-like masses of ovaries filled with minute eggs. They are eaten raw, and furnish food supply the year round. The Aleut take mussels (*Modiola* and *Mytilus*), which grow about their islands to an enormous size, also sea-bird eggs in great abundance, and they are thankful for a stranded whale.

All along the north Pacific coast fish-spawn is collected from boughs of evergreen stuck in shallow water. When the boughs are withdrawn loaded with spawn they are transported to the hut, where they are hung up, the eggs being devoured as wanted. On the coast of British Columbia the oolakan are so abundant that both men and animals scoop them out of the water. Along the bays and seacoast of Oregon and Washington and the eastern portion of United States, as well as on parts of the coast of South America, shellfish existed in the greatest variety and abundance.

Vast quantities of them were gathered and eaten, leaving immense shellheaps. The Makah Indians of Washington gathered bivalves, barnacles, holothurians, periwinkles, and limpets with the hand, without apparatus, and smoked them and dried them for winter.

There are tribes of Indians on the western coast of United States who catch turbot and flounders with their feet. Wading slowly into the pools, the Indian feels the fish with his feet, and instantly stepping upon it, holds it firmly enough to reach down with his hands and toss it out. Swan says that a large number engage in this sport, and their splashing, slipping, screaming, and laughing make a merry noise.

According to Powers, the Wintun Indians of California dive many feet for clams; they remain down a long time, and rise with one or more in each hand and one in the mouth.

The Big Meadow Indians of California, in order to procure worms for bait, gather their families upon a damp piece of ground, where they dance and sing until the worms seek refuge in the open air, and are gathered with the hand.

The Wailaki of California capture deer by running them down afoot. The deer follow certain trails, and the Indians post relays of men along these, and so give the animal continual chase until he is so blown that he either stands at bay or takes to the water. They also capture rabbits by running them down. They terrify the animals by beating the bushes and screaming until they are easily overcome.

The Micmac Indians of Nova Scotia will run down a stag, commencing early in the day and following it without intermission. The stag outstrips his pursuer at first, but is afterward captured with comparative ease.

According to Adair, the Choctaw caught catfish with their hands. The Yeguases, Davis says, were fleet runners, able to run down a deer, in which manner they frequently caught them. Professor McGee tells of Seri boys who run down flocks of birds, rab-

bits, and other swift animals, bringing contempt on themselves if they fail. The Pueblo Indians frequently chase and capture cottontail rabbits without weapons of any sort.

Lumholtz says that in warm weather the Tarahumari catch fish with their hands in the crevices of the rocks, and pursue deer in the snow day after day until the animal is cornered. These Indians are among the most famous runners known to us.

The natives of the Antilles are said to have stolen on fish, concealing themselves among the rocks and sea plants, then seizing them with their hands. The Macusi Indian of Guiana dives from his canoe after a particular kind of fish, chases it to the bank, drives it into a hole there, seizes it with his hands, and brings it up. The Mura of the Amazon, according to Bates, dive for turtles and catch them by the legs. Especially is this true in the lakes where they are imprisoned during the dry season.

The distribution of this method of capture is almost universal in both Americas, and is sufficiently exemplified in the foregoing examples.

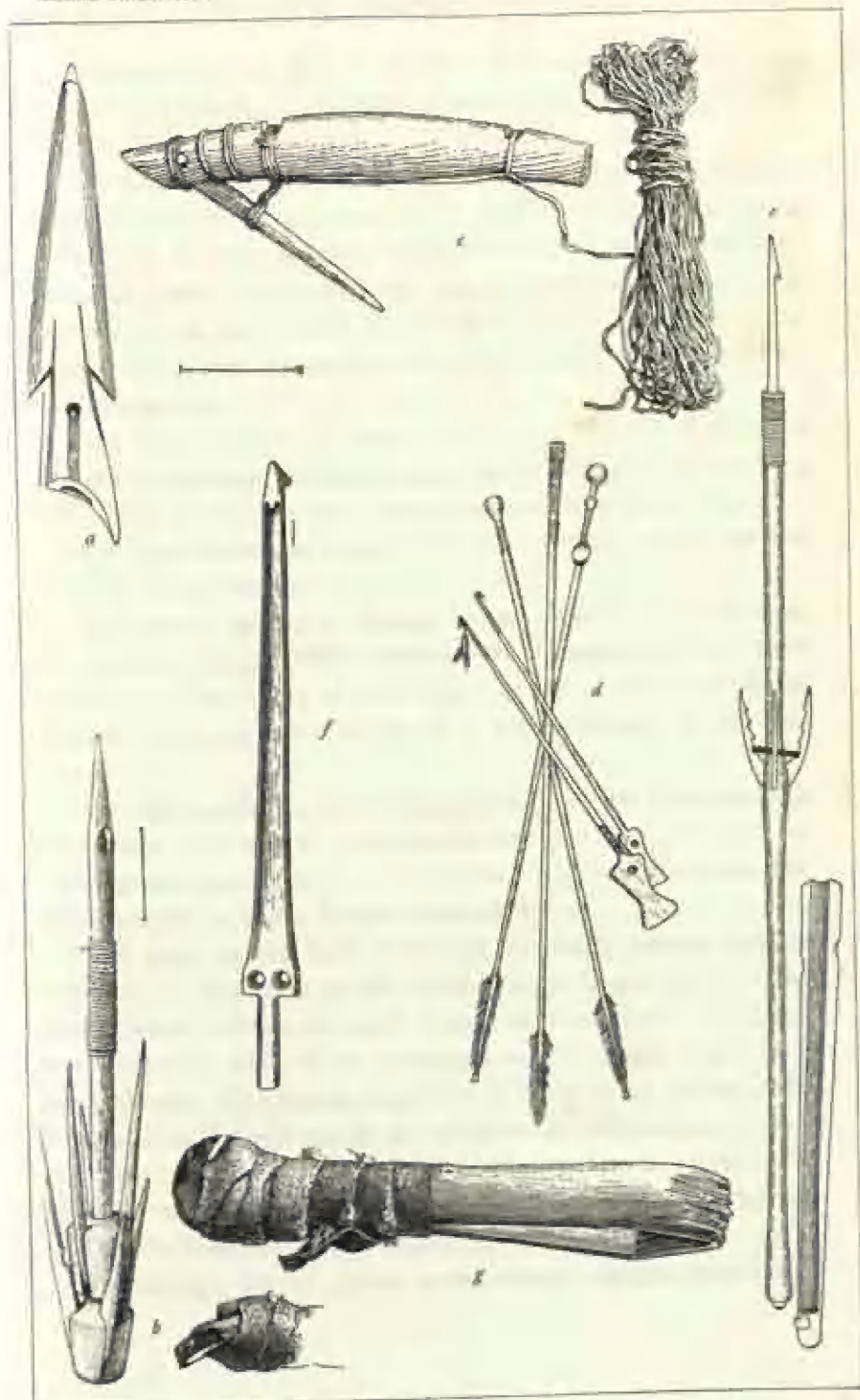
In hand capture, death is produced by simply removing the animal from its environment. Few savages swallow their animal food alive. Aquatic animals are asphyxiated and killed in the catching of them. Often aquatic mammals are killed by drowning—by holding them under water until they succumb. Burrowing animals are suffocated by simply burying them alive.

SECOND METHOD OF CAPTURE

The second method of taking animals involves some sort of device or mechanism for seizing. Such inventions are more or less substitutes for or accessories to the human hand and fingers. When the hand is held with the palm upward, it is a scoop; the fingers are a rake; the forefinger is an excellent and versatile hook; the closed fingers and hand hold fast and arrest, and the heavy fist or heel of a fisherman is no mean club. It is the inventor's design to imitate them. (See plate II.)

EXPLANATION OF PLATE II

- a. Harpoon head for retrieving, showing toggle and barb types in one. U. S. N. M., No. 89,379. Collected by P. H. Ray.
- b. Fishgig; shank, body, and flukes of bone. U. S. N. M., No. 30,407. Collected by E. W. Nelson.
- c. Fish-hook from the Naskapi Indians (Algonquian) of Labrador; shank, of wood, split at the lower end to receive the fluke of bone; line of baliche. U. S. N. M., No. 89,977. Collected by Lucien M. Turner.
- d. Throwing-sticks and stunning-darts from Xingu river, South America. (After Von den Steinen.)
- e. Bird dart, for piercing and entangling, and throwing-board of East Greenland Eskimo. U. S. N. M., No. 165,974. Collected by Capt. G. Holm.
- f. Modern atlatl or throwing-stick from Lake Patzcuaro, Mexico. U. S. N. M., No. 153,020. Collected by Capt. John G. Bourke.
- g. Hide scraper, with blade of glass and grip of wood, from the Tehuelche Indians of Patagonia. U. S. N. M., No. 178,403. Collected by J. B. Hatcher.



ZOOTECNIC IMPLEMENTS

Of the seizing, as well as of other methods of capture, there are varieties based on the fact of distance between the hunter and his game.

The first or primitive variety of seizing apparatus is held in the hand without any attachment of the shaft or handle whatsoever. Professor E. Krause mentions the fact that the Lengua Indians in the Gran Chaco, South America, wrap around the hands a band, to which short, hard spines of fish are fastened. As soon as the hand is closed these spines pierce the skin of the game and prevent its slipping away.

The second variety or class is fitted upon the end of a handle or shaft or thong, of varying length, always having at the working end a hook or loop or other device for retrieving (plate II, *a*).

The third variety is thrown from the hand and has connected with it a retrieving line.

The fourth variety is thrown by means of a throwing-stick or amentum, and is either attached to a retrieving line or is associated with a bow of this class. Many of these retrieving devices, however, are compounded with methods to be discussed later.

The fifth variety of harvesting apparatus of this kind would be discharged from a bow. Associated with the bow will be a retrieving arrow attached to a line by means of which the game may be recovered, as in the Eskimo muskrat arrow.

The most simple kind of taking by hand through devices would be an imitation of the open hand or double palm. The second would imitate the open fingers, used as a rake. The third would take the place of the forefinger or of the bent fingers, acting as hooks. The fourth would act in the way of seizure. All of these pass through grades of evolution or elaboration, becoming more and more complicated as the capture becomes more difficult; and also the classes of inventions herein included will exhibit the varieties of application just mentioned.

As the scarcity of game, even among savages, made the

distance greater between it and the hunter, making necessary the development of different kinds of taking, so the noise and terror that came with the gun were the death knell of savage inventions, since they remove the animal out of the reach of all savage weapons.

Scooping devices imitate the open hand or the two hands held together. The dip-net in its multifarious forms is a mechanical realization of this idea, although it is well known that baskets, mats, and all sorts of vessels were used for the purpose of scooping fish from the water when the schools were passing over shallow places. It is a matter of doubt whether nets of this kind were used extensively in America prior to its discovery. Hearne says of the Eskimo that "no appearance of nets was discovered there at their tents or any other part of the shore." Mackenzie, however, declares that the Chipewaiian took the beaver in nets, and Schwatka pictures an Aiyai Indian of the Yukon drawing a fish into his canoe with a dip-net.

The Indians of southern United States are declared to have had nets of hemp, and Mr Cushing dug from the muck beds of San Marco, Florida, dip-nets of fine mesh.

At Cook's inlet the Kenai erect stages over the water and dip up salmon in baskets. Swan asserts that among the Indians of Washington the knowledge and use of the net antedate the first white man. In Nootka sound shoals of sardines are driven into the coves and shallow water and scooped up with wooden troughs and wicker baskets. The Modok Indian drags a scoop-net at the stern of his canoe, and when the catch is sufficient, the net is emptied by the fisherman.

The Mission Indians and other tribes of California caught jack-rabbits in nets. The Concow use the same apparatus for catching grasshoppers, of which they are very fond.

Small hand-nets are described as in use by the natives of Xingu river in South America. The Peruvian coast Indian drags a net at the stern of his balsa.

Indeed, some variety of this method of taking game is universally practiced throughout the two continents.

Rake devices imitate the fingers half bent, and are used in gathering mollusks. In several parts of America rakes were made by driving bones into handles, and thus animals were gathered. In many of these, piercing and also retrieving functions are superadded to that of gathering.

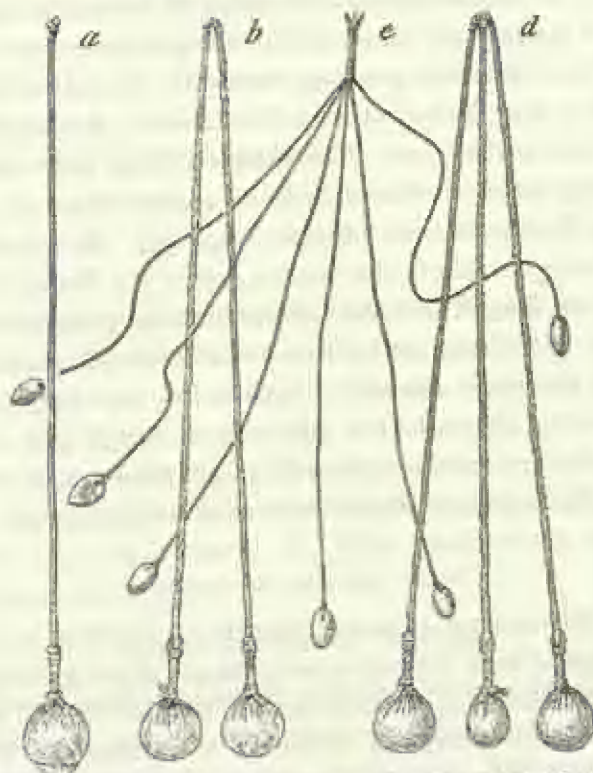


FIG. 1—*a, b, d*, Bolas for ostrich and guanaco, from Patagonia (U. S. N. M. No. 130,303; collected by Leslie Lee); *c*, Bolas for water birds, from Alaska (U. S. N. M. No. 71,950; collected by P. H. Ray).

The hook resembles the bent finger or fingers. This device has called forth a great deal of ingenuity. Commencing with the crooked finger, there comes the hand aided by the short hook; the gaff hook; the hook at the end of a string, or squid hook;

baited hooks; barbed hooks; compound hooks; automatic hooks; accessories to hooks, such as lassos, sinkers, triggers, etc. It is impossible here to enter into the distribution of this vast collection of material in precolumbian times. It must not be overlooked, however, that angling became vastly more complicated after foreign contact. (See plate II, *b, c*.)

Gripping devices imitate the closed fingers or closed hand, and they are represented by all kinds of lassos, bolas, chokers, and hand nooses; net traps, which belong to an entirely different class. The leister is a gripping device to which the function of seizing is added. In some forms this class has a distribution which is not fully worked out. For instance, bolas exist among the bird-eating tribes of Alaska and the guanaco-hunting tribes of southern South America (figure 1, page 59). In colonial times trout-noosing existed in the eastern part of the United States.

Birds are caught in California by a running noose at the end of a pole. The Panamint Indians of California seize lizards in this way, and Rochefort describes a "gin having a running knot which is fastened to the end of a pole and cunningly got about the necks of the iguana lizards in order to get them out of the trees."

The distribution of the lasso is yet to be determined.

THIRD METHOD OF CAPTURE

The third method of taking animals is by striking or crushing. In its simplest form it involves only the use of the human body—the fist in striking, and the knee, the heel, or rolling stones in crushing. With increasing difficulty of capture this process is followed by striking with a weight in the hand, with a club, with a sling-shot or *bola perdida*, with a dart-sling or throwing-stick, with a sling or stone-bow, and with a blunt arrow. The beginning of such a series would be the fist, and the termination, the cannon-ball. Among traps the dead-fall occupies the same position.

In the Arctic regions, and, indeed, one might say universally throughout America, the club is an implement of capture either

alone or in connection with other implements. In some areas the club is an unadorned killing device, in others much skill is expended on it in decorations that are either totemic or sorcerous, and in its most efficient form it cuts or pierces as well. Throughout the buffalo country a peculiar form of club prevailed, and it is still seen, by the way, down to the borders of Mexico. A ball of stone is enclosed in a rawhide bag which is loosely attached to a short handle, after the manner of a flail.

On the western coast of the United States the sling begins to appear. Powers says that the Copehan tribes killed wild fowl with a sling, using bolas made of hard-baked clay. Ray also brought the sling from this region.

All over the southwestern country the non-returning boomerang is common. Lumholtz says the Tarahumari Indians kill birds with stones.

Gemelli Careri says that the Indians "kill" small birds on the highest trees with pellets shot out of trunks. The sling, however, had its greatest use and distribution on the cordillera of South America. The tribes of the Mato Grosso used a stunning dart with their throwing-sticks. Stunning arrows, sometimes bird arrows with blunt heads, are found all the way from the Arctic Eskimo to Argentina (plate II, *d*). Wells mentions the use of the sling in Tierra del Fuego.

FOURTH METHOD OF CAPTURE

The fourth method of taking animals is with an edged weapon. The sword is the acme of all such inventions. In the almost entire absence of wrought metal, throughout America, slashing weapons were of stone, bone, or hardwood. The rapidity with which natives in all parts of this hemisphere adopted the use of iron and steel prevents the present examination of the method of using the primitive edged tools. However, there is no spot on either continent, where available material is to be found, that does not reveal the universal use of the hunting knife. The sim-

plest example of this in the National Museum has a leaf-shape, chipped blade, one end of which is wrapped with a long strip of otter fur to serve as a handle.

Departing from this starting point, it is easy to trace the edged weapon through the knife, the American form of the *pattu pattu* or stone swords, the style common among the Sioux and in Mexico of inserting blades into a club.

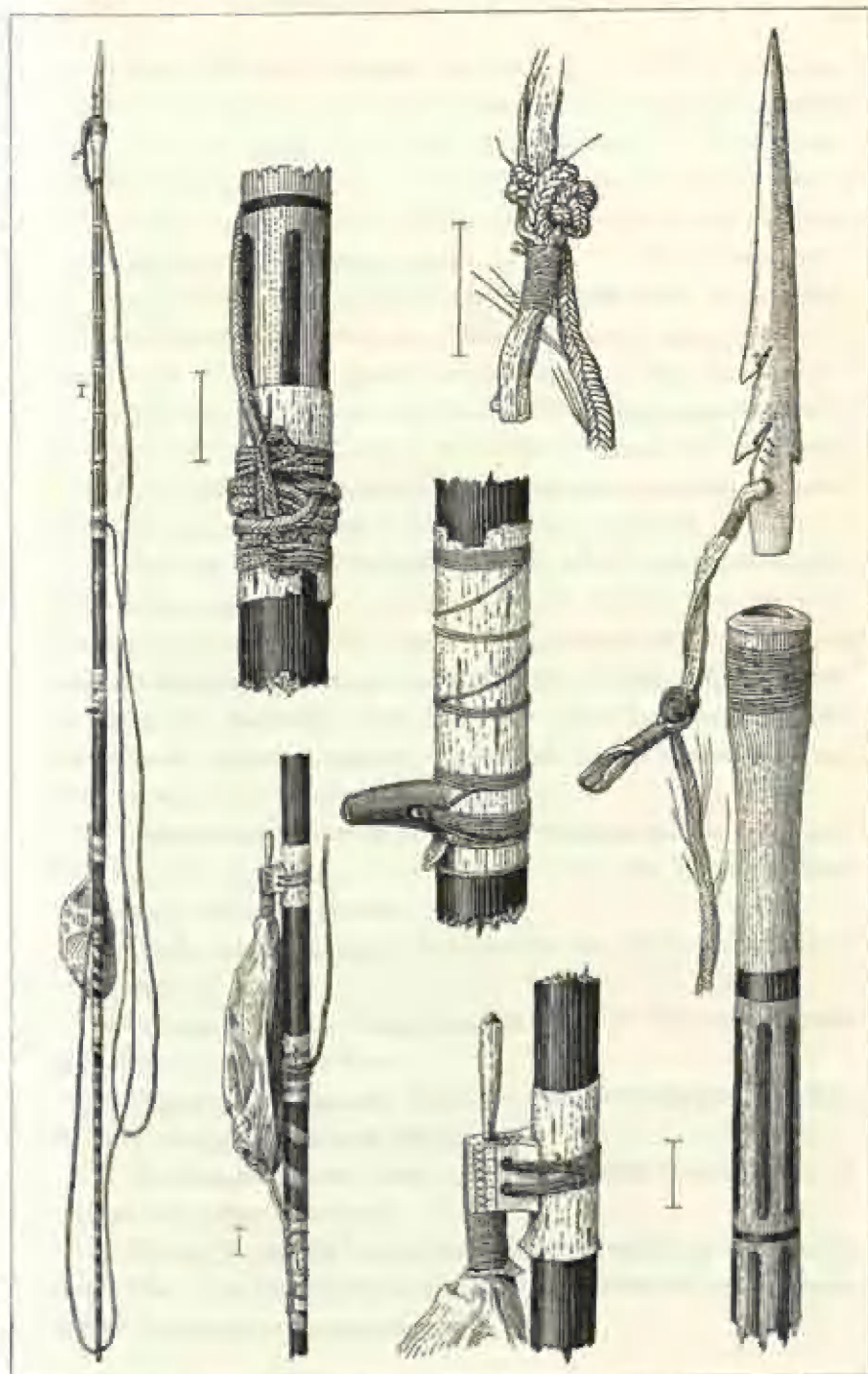
The *macana*, described by Hawkins, in 1593, as "a sword of heavy black wood some four fingers broad, an inch thick, and an ell long, something broader at the top than at the handle," has wide distribution in South America. The edged or cutting arrow, common in various parts of the eastern hemisphere, is not known to have existed in America.

FIFTH METHOD OF CAPTURE

The fifth method of taking animals is with some piercing device. These devices are far more numerous than those employed in all the other methods, and have been subject to the widest differentiations of form and complexity of development. A full discussion of those on the American continent would far transcend the limits of this paper.

Piercing devices begin with a thorn or sharpened bone held in the hand. When the point has a short handle, it is a dagger; when it has a long handle, it is a lance; if the point is barbed for retrieving, it becomes a spear; when shot from a bow, it is an arrow; when hurled from the hand or throwing-stick, it is a dart; when it has a detachable point, it is a harpoon, and these may be either barbed harpoons or toggle harpoons. Above these simple forms there are many that involve two or more of the processes named. A great many of them serve the double purpose of piercing and retrieving. (See plate III.)

The lance was used anciently for stabbing, and it could be withdrawn; it exists with a point or blade of chipped stone, bone,



BARBED HARPOON

Barbed head and hand-rest of bone; long-shaft of wood; line of sinew; float of seal bladder. When the animal is struck the barb is detached and the shaft is made to float vertically by the martingale and bladder. (U. S. N. M., No. 11,364. Collected by Vincent Colyer.)

or shell, or with one hardened by fire. Every Eskimo *kaiak* has among its multifarious accouterments a large stabbing lance which may be driven again and again into the seal or other animal. The western Eskimo have a form of lance with detachable points that are left in the animal. Each hunter carries a bag of them, and when he comes in close quarters with a walrus or other game, he plunges one after another into the beast until it is killed. Blades of iron have universally taken the place of stone and other substances. The Cree Indians extemporize a lance by lashing a hunting knife to a long pole. On the Mosquito coast the turtle is struck with a lance having a point like a file and without barbs. A spear in this connection is a lance with barbs on the point, and the bird, mammal, or fish is transfixes and retrieved.

In the Eskimo area the bird-spear, so called, exists universally; that is, the points at the working end are barbed, and there are barbed pieces also on the sides. These perform the function not only of transfixing, but, as mentioned in a former section, of entangling and grasping. The fish-spear exists in great profusion throughout Eskimo territory where fish are in abundance and may be captured by spearing (plate II, *e*).

An interesting group of devices for piercing are the bows and arrows. The following table will set forth the types of these weapons in the areas named:

1. Arctic area; compound bows in the east, sinew-backed bows in the west.
2. Athapascan area; long, straight bows of willow and birch with wristguard on the bow.
3. Algonquian-Iroquois; plain or self-bow of hardwood—ash, hickory, osage orange, and oak.
4. Muskogean bow; long, with rectangular cross-section, of walnut and other hardwood.
5. Rocky Mountain bow, in two varieties—plain or self-bow of Bois d'Arc, and a compound bow of buffalo horn in two or three pieces, wrapped and strengthened.

6. North Pacific bow; round grip and flat wings, generally of yew or cedar.

7. Columbia River bow; similar to number 6, with wings much shorter and the necks sharply incurved.

8. Interior Basin bow; a long, slender stick, lined on the back with shredded sinew, strengthened by cross-wrapping here and there.

9. California bow; like number 7, but neatly lined with sinew and ornamented.

10. Pueblo bow; like number 8, but frequently without backing. In the southern portion of this area long cottonwood bows with cross-lashing are used by the Yuman and Piman Indians.

11. Middle American bow; hard palm wood, long and rectangular in cross-section; in the northern portion, short and flat.

12. Antillean bow. Little is known of this type, but probably it resembles the types of the Venezuela and Guiana regions, which are long and slender.

13. Cordilleran bow. Wherever the sling was predominant the bow was not much used, and this is true of the highland regions of South America. The Amazonian type intrudes here.

14. Upper Amazon bow; of palm wood, rectangle or long ellipse in section.

15. East Brazilian bow; of hardwood, semicircular in section, mixed southward.

16. Mato Grosso bow; bows of the east and west overlapping.

17. Argentina bow; of hardwood, small, round in section, disappearing after the introduction of the horse.

18. Fuegian bow; round in section and small.

No less interesting than the bow is the arrow in its geographic distribution throughout the western world. On the whole, the structure has not been materially changed by the introduction of metal, iron and brass taking the place of stone and other substances.

1. Arctic arrow. In the treeless Eskimo region the arrow-shaft is made of driftwood or of small pieces from wrecks spliced together and tipped originally with bone, most of them being barbed either for deer hunting or for fishing.

2. Athapascan arrows differ a little from Eskimo arrows, especially those that are designed for killing caribou.

3. The Algonquian arrow had a simple shaft (but no foreshaft), feathers, and head of chipped stone, fastened on the top with sinew; but in the fishing regions all sorts of barbed pieces replace the stone, each having one or more barbs.

4. The Muskogean arrow was made of reed cane, and had wooden as well as stone points for different purposes.

5. The Rocky Mountain arrow has a short, hardwood shaft with blood streaks, and formerly a head of stone, but this is now replaced universally with iron.

6. The North Pacific arrow has a shaft of cedar with two flat or three radiating feathers, and a head of bone or iron. These are better made than the arrows of the Eskimo.

7. The Columbia River arrow is neatly made with a shaft of cedar and a head of two or more prongs, usually barbed.

8. The Interior Basin arrow resembles that of the Rocky Mountain region, though on its western side it merges into that of the Columbia River region.

9. The California arrows differ in special characteristics from place to place, but all are delicately made with light shaft, hard foreshaft, fine obsidian or stone point, and three feathers, usually highly ornamented.

10. Of the Pueblo arrows there are two kinds—those made under northern influence have a single shaft, while those made under southern influence have a reed shaft and hardwood foreshaft with points of stone or glass.

11. The Middle American arrow is long and has a shaft of reed with flat feathering.

12. Antillean arrow. According to Hermann Meyer the arrows

of the southern region are best distinguished by their feathering. In the Guiana foreshafted arrow there are two short half-feathers bound to the shaft with seizings of fine thread. This is also the region of the blow-tube and curari poison.

13. Cordilleran arrow. Where the arrow exists in this region the feathering resembles that of the next group.

14. Upper Amazon arrow. Two feathers attached to the shaftment with black cement and held in place by a spiral winding of thread.

15. Eastern Brazilian arrow. Two whole feathers fastened by their ends with thread or bast frequently laid on in patterns.

16. Mato Grosso arrow. Great confusion of arrows of different types.

17. Argentina arrow. Two feathers wrapped and cemented.

18. Fuegian arrow. Diminutive arrow with very short feathering and delicate point.

The blow-tube is a tropical invention confined to areas where the cane abounds and also where bows and arrows are not serviceable weapons. The two areas of its full development are South America and Malaysia. The weapon consists of a straight tube of cane and a short arrow; at the base of the latter wadding is wrapped. Frequently the points of the little darts are poisoned.

The weapon of the western continent is somewhat better adapted to wooded regions where abound monkeys and birds of beautiful plumage. It is found sparingly in southern United States. The Chetimacha of Louisiana used a compound weapon in which four or more tubes were lashed together as in a pan-pipe.

In Venezuela, Guiana, and eastern Brazil abound the *sarabatana* (also called *gravatana*) and *pucuna*. They are mentioned by E. F. im Thurn, Schomburgk, Wallace, Simpson, and Bates. The Caribs insert a tube of palm wood into a stem of *Arundinaria schomburgkii*.

Instead of reeds the Napo Indians use a tube made in the following manner: A good piece of *chonto* palm, the hardest palm found in the country, is selected and a groove cut into it with a knife, to the length of about 7 to 9 feet. This groove is then scraped and rubbed with sand, finer and finer, until it assumes perfect smoothness. Another half tube, exactly similar, is made, and the two are then bound together with wax and fiber, the result being a long, heavy pipe with a bore about three-eighths of an inch in diameter, which on examination proves to be almost as true and polished as a gun barrel. Through this the insignificant though deadly poisoned-tipped darts are blown with unerring precision, conveying silent and sure death to their mark.

Next to the bow and arrow the most complicated piercing weapon for hunting is the harpoon, which may be described as a retrieving spear with a movable head. It may be either barbed or toggled. The barbed harpoon is universal in America, and the toggle exists in some areas in a very simple form; but the whole outfit of the Eskimo in the use of this apparatus, and the apparatus itself, form a most intricate device for hunting.

From old graves in Greenland and other Arctic areas toggle heads have been found which show the transition from the barbed head to a very simple form of the toggle. Examining these in comparison with the latest forms proves that Siberian, Russian, and European influences have combined with Eskimo ingenuity in developing the modern form. Even for this most improved type there are varieties differing in size, material, shape, and relationship of the parts according to the environment, the animal to be captured, and the intelligence of the maker. So we have whale harpoons, walrus harpoons, seal harpoons, hand harpoons, thrown harpoons, retrieving harpoons, and harpoons with floats.

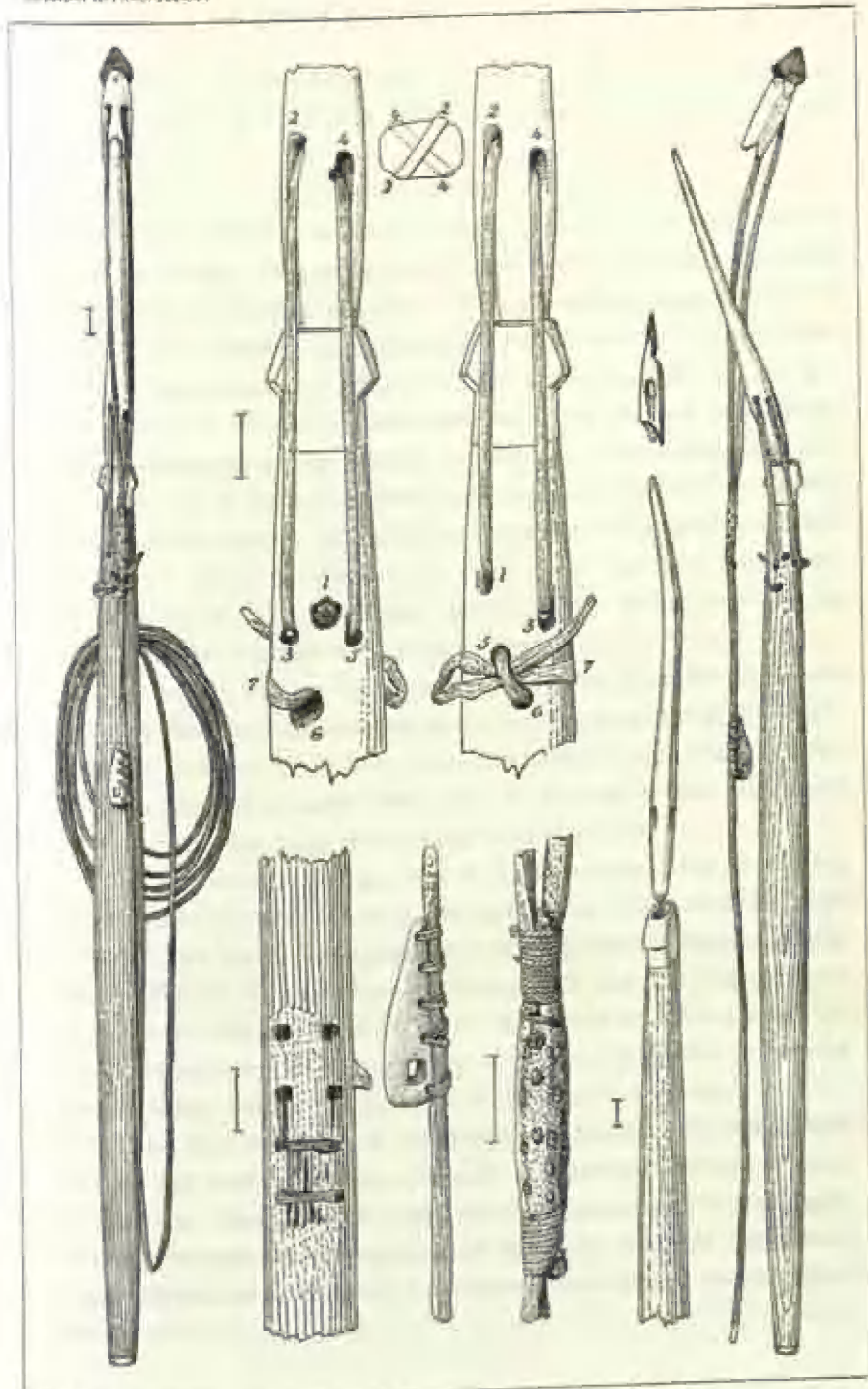
The Giliak long pole and float combined do not extend in America, but eastern Greenlanders have a small sled to carry the point on the ice which corresponds exactly in function with

the Giliak float. They also have a deep-sea harpoon with long shaft, operated by two hunters.

The parts of a toggle harpoon head are the toggle head, the body of the head, the spur, barbs, blade, shaft hole, line hole, grooves, and leader or short line (this works on a loose shaft of varying form hinged to the shaft), foreshaft (which differs in material and shape, joining with the shaft), socket for the foreshaft, and accessories. Shafts differ in material, in length and size, in the number and position of the pegs, in the hand stop or rest, in the laying on of the assembling line and ice pick. Add to this the floats, float rack, and other appurtenances on the canoe or *kaiak*, and it will be seen how excellent an object for studying distribution and development for technique this weapon becomes (plate IV).

In a more extended work on *zootechny* the discussion and distribution of the barbed and toggle harpoons throughout the western hemisphere will be fully set forth.

Closely associated with the harpoon is the so-called throwing-stick, or dart sling, or harpoon sling, or Mexican *atlatl*. It is a piece of wood or reed, the working end of which is a hook of some sort to engage the but-end of a dart or harpoon. Its manual end may be merely rounded for a hand grip, or it may be carefully wrought out to fit the right hand of the hunter. The device practically adds another joint to the hunter's arm. With specific variations it is found from Greenland to Siberia among the Eskimo; it occurs also in southeastern Alaska, down the Pacific coast to Columbia river, among the cliff dwellers of the Interior basin, in the keys of southern Florida, and thence southward through Central America to Colombia, on the upper Amazon, in the Mato Grosso, and in eastern Brazil. In the Report of the United States National Museum for 1883-84 the writer published a paper on Eskimo throwing-sticks, since which time many contributions have appeared relative to this curious invention (plate II, *f*). Among the writers should be named Kristian



TOGGLE HARPOON AND LINE FROM CUMBERLAND GULF

U. S. N. M., No. 19,579. Collected by G. V. Nickerson

Bahnson, G. W. Lüders, Adrien de Mortillet, John Murdoch, Zelia Nuttall, C. H. Read, Edward Seler, Hjalmar Stolpe, and Max Uhle.

SIXTH METHOD OF CAPTURE

The sixth method of taking animals is classed under the general name of traps. In the second, third, fourth, and fifth methods the animal succumbs to force. The prevailing thought in the mind of the captor is that of seizure and destruction without consulting the desires and idiosyncrasies of the animal; but in the whole class of devices enumerated under the general term traps, the psychology of the victim is seriously considered, and the game is not killed or violently captured, but induced by various deceits of the hunter, who may be absent or concealed, to commit suicide or self-incarceration. In one place the bird comes unsuspectingly to its accustomed roosting-place and is held fast by a bird-lime or a snood encircling its feet.

The whole class of destructive weapons is imitated in the trapping devices; animals are seized by the foot or by the head; they are stunned by a blow; they are seriously cut with a blade; they are pierced in some vital part, or they are induced or driven into an enclosure from which they cannot escape.

Indeed, there is no great gulf fixed between the foregoing classes in which man, as an active agent, is present, and the trap; some of the latter are operated partly by the victim and partly by the hunter concealed, as in the case of the fall trap used by boys for catching snowbirds. The little stick which supports the weight is fastened to a long string that is pulled by the concealed hunter when a sufficient number of birds have come in.

When the minutiae of the traps are considered, one might almost say that there is a different mechanism for each species of animal. The parts of a trap are, as in tools, the working part and the manual part (or that which takes the place of the human hand), together with such intervening devices as render these coöperative.

Many additions to the language have been made by the trapper, such as springe, snare, gin, pit-fall, dead-fall, gill-net, noose, enclosure, pound, creel, weir, and others.

There is also an opportunity in this division of the subject to study elaboration or perfection. For instance, among the most primitive people exist forms of driving animals into some sort of a corner, or enclosure, or pit, or body of water, and even fishermen construct rude fykes and fish traps into which large numbers of fish are driven, and this finally leads to the development of the regular fykes in our rivers.

The net in this connection has a very extensive development. One form of this apparatus was mentioned in the second division of this subject—the method of taking by hand,—that is, the scoop-net; but the set-net, the gill-net, and the fyke combined gave rise to a great variety of trap structures.

The snare in its simplest form is a noose set in the way of animals that go in trails or paths, but later is manifested by the addition of a spring as in the ordinary rabbit springe of the country boy.

The greatest ingenuity, however, is manifested in the structure of what is generally known as traps. Under this name are included, on the American continent, stomach springs, closing pen-traps, clutching traps, fall traps, cage traps, empalement traps, and missile traps. These may be divided according to the method of preparing them for their work into man-set, self-set, ever-set, and victim-set.

SEVENTH METHOD OF CAPTURE

The seventh method of taking animals is by the aid or help of other animals, either as decoys to lure the victim to destruction, or, as dogs and other hunting animals, to chase down or kill.

The remora, however, used by the people of the Antilles for taking larger marine animals, is a fish which, by means of a sucker, attaches itself to the prey and is retrieved by means of a line

attached to its body. In this case the hunting animal is really a living capture device (second method).

Insensibly, animals in contact with savage tribes enter into the thinking of these tribes. Not only are the people modified because of the existence of the helpfulness of these animals, but the animals themselves become modified and helpful to the people or suspicious of them; their whole conduct is changed.

A story is told of a traveler in the Andes, in company with an Indian guide, being informed of the existence of animals of prey actually engaged in devouring a victim simply by the flight of birds overhead. Examples of this unconscious intercommunication and helpfulness are innumerable.

The one animal that has been most helpful to man on the western continent, in the matter of hunting, is the dog, especially in the Arctic regions.

EIGHTH METHOD OF CAPTURE

The eighth method of taking animals is by means of fire through its phases of heat, light, and smoke. The light of the torch serves a double purpose, it illuminates the area of hunting and confuses or attracts the game.

The Seneka are said to have hunted deer at night in canoes, having a wax candle fastened to the bow. The Indians of Puget sound also used a torch to hunt elk, deer, and waterfowl at night. In the case of the latter they erected tall poles to which nets were stretched; when they held their torches behind the nets the migrating birds would fly against it and fall to the ground. The California Indians, as well as the eastern Indians, fished by torchlight.

Squier describes fishing on the Mosquito coast by torchlight made of bundles of fat pine fastened to the top of a long pole. Indeed, the tropical tribes, especially in the Antilles, were accustomed to use torches in fishing with dip-nets in the rivers at night. It is said that the Indians of Chesapeake bay formerly would light

torches in their canoes at night, and that the fish, attracted by the light and attempting to jump over the boat, would land inside. At times the fishermen were compelled to put out the light to prevent the fish from sinking the boat.

Fire was used also for burrowing animals out of their dens; but the most exciting and effective use of fire for hunting was by the Indians of the plains of the great west. In their annual buffalo hunts large droves of these animals were corralled by means of fire.

The "Digger" Indians of California employed fire in corraling rabbits. In doing this they also obtained large quantities of grasshoppers, the fire having merely singed their wings. "As the squaws picked up the insects they crushed the head between the thumb and finger to kill them, and then tossed them over their shoulders into their conical baskets." These were used for food.

NINTH METHOD OF CAPTURE

The ninth method of taking animals is by poison. This term is used in a general sense and applies to all methods of capture in which the digestive organs are attacked.

Cabeza de Vaca noted the practice of poisoning in Florida. Adair says that it was general throughout the southern states. Dr Chesnut, of the Department of Agriculture, mentions among the poison plants of southeastern United States a horse chestnut (*Æsculus pavia* L.) used in stupefying fish. The California Indians, when the streams run low and the fish collect in deep holes, cut off the water from above and use soap root which soon causes the fish to float upon the water. The Countess di Brazzà says that the Pima used large quantities of *Sebastiana palmieri* for poisoning fish. Lumholtz makes the same assertion with reference to the Tarahumari Indians of northern Mexico, and Squier gives an interesting description of the poisoning of fish by the Payas of Honduras.

Brinton mentions the Moguexes, in southern Colombia, who

stupefy themselves with stramonium, which they use also in catching fish. The Gentleman of Elvas says that in Peru great abundance of fish were asphyxiated in this way and then killed with clubs. The Indians of southeastern Brazil use a number of leaves, as well as roots and bark, for this purpose. The tribes of the lower Amazon and of the upper Negro poison fish in the same manner. Von den Steinen says that the Xingu tribes do not poison fish.

The use of poisoned arrows by the North American tribes is a mooted question and would not apply to hunting; but in the study of poison in the capture of animals one should not overlook the question of the curari poison in the northern portions of South America, especially among Carib tribes.

An enormous bibliography of this subject is to be found at the Surgeon-General's Library in Washington, and also in the great *Index Catalogue* of that library.

ACCESSORIES OF CAPTURE

Besides the apparatus used immediately by the hunter to kill or to secure his game, there are a thousand and one accessories thought to be indispensable. In the pursuit he modifies his dress or has special cover or protection from the weather.

John Smith says that the Indians carried mats to kneel on in their canoes when they went on hunting expeditions, and when they landed they used the mats to make huts.

Nelson records the fact that the Eskimo of Norton sound carry wooden plugs in their canoes, and when a seal is stabbed the hunter blows up, with his mouth, the skin of the dead animal, and, thrusting one of these plugs into the hole, renders the animal buoyant so that the hunter may tow it ashore.

Every invention designed to assist the hunter in approaching the game, or dispatching it, or carrying it home, or protecting himself, may go under the general title of accessories to hunting. It is quite possible that in this association the invention of fire

making and of condensed food for long journeys took place. Here belong decoys, ice-creepers, and snowshoes.

In Drake's *The World Encompassed* there is a very vivid description of a rhea hunter who "carries a great and large plume of feathers on a staffe, in the forepart bearing a likeness of the head, and necke, and bulke of an ostrich."

The seal hunter draws his hood over his head, lies down on the ice, and approaches the victim by stealth, taking advantage of its forty winks.

Before the intrusion of the gun there is no doubt that wariness, sound and sight decoys, and disguises of all kinds were in universal use in the western hemisphere. The author has collected a large number of these appeals to the eyes and ears of the game in order to get within reach of the dispatching weapon.

DOMESTICATION

The domestication of animals is not, strictly speaking, a mode of capture, and yet, when the processes by which wild creatures are brought under the domination of man are understood, it will be found that it is a slow and insidious method of capture. In fact, all vermin and other noxious creatures are self-domesticated. The ox, horse, ass, camel, sheep, goat, and hog came to man slowly and in droves. On the western hemisphere they antedated man, existing now as fossils or poorly allied species. Few of these congeners were domesticable. Professor McGee has drawn attention to the subtle manner in which the animals in our southwestern regions have come into diplomatic relations and compromises with the Seri and Papago Indians.

The dog in both Americas, the peccary and the llama in South America, for pets, for hunting, for packing, for travois, or for traction, were the farthest advanced in the school of domestication among the animals of the western hemisphere; but every tribe had, in addition to these, birds and beasts which responded to some desire of the adults or children or have come under their

sway. Among these partially subdued creatures were schools of fishes and herds of ruminants corraled to be killed ad libitum. Around nearly every southwestern pueblo there are cages for the incarceration of wild creatures, and the snakes for their ceremonies are gathered in pits. The Mexicans made special houses for birds and beasts. E. F. im Thurn calls attention to the interminable chatter of pets about the Indian habitations in Guiana, and says the racoon (*Nasua socialis*) is more often seen tame than wild. The peccary was partly tamed both in Mexico and on the Amazon. The whole subject of domestication on the western continent has been laboriously worked out by Payne.¹

III. PROCESSES IN ZOÏTECHNY

The third division of zoïtechny embraces all the activities included in the disposal of animals after they are in hand.

It was mentioned in the beginning of the section on "Capture" that a great many of the animals taken by savages are eaten on the spot, but even of this simple harvest much is carried away, and this involves, therefore, the methods of carrying in use from region to region, and hence the vast array of transportation utensils. On the waters, frequently the freight boat is different from the hunting boat; on the land, in the Arctic region, the small freight sled is much clumsier than the traveling sled, and here we have the origin of sleds and of shipbuilding. The pack-saddle and travois for dogs were used by the hunters chiefly in conveying their game, and it would not be difficult to find in any museum a collection of hunters' devices for bringing home the fruit of their labors. Even the special craft for fishing are modified so that the hunter may not only take his game, but may freight it home.

The butcher's art of cutting up the carcass, and the smoking

¹ Payne, Edward John, *History of the New World called America*, Oxford, 1892, vol. I, pp. 311-331. Consult also B. Langkavel, *Hunde und Naturvölker (Internationales Archiv für Ethnographie)*, Leiden, 1895, vol. VIII, pp. 109-149, with copious bibliography.

and drying of fish, mollusks, and flesh, require considerable care, labor, and ingenuity. The forming of store-houses, storage pits, and caches, in which a supply of meat is laid up for the future, was an industry practiced to a large extent in both Americas.

All the tribes of the United States and of British America were known to have dried and smoked both fish and flesh. The Nootka Indians procure the oil of the whale by placing the blubber in boxes and melting it with hot stones. The Alaskan British Columbia tribes dug circular pits both at their homes and around their fishing places, lined them with dry bark, and filled them with salmon, covering the hole with bark and earth. The Indians of Puget sound dry large quantities of clams and fish eggs. The Virginia Indians practiced the same art.

The hides of animals were not less the means of developing the inventive faculty. Leaving out the machinery for harnessing power, modern tanning involves no new processes of unhairing, fleshing, tawing, and manipulating hides. (See plate II, *g*.)

In the mechanical processes, the bones, sinews, skins, teeth, horns, hair, intestines, shells, and spines of animals supply hammers, knives, wedges, levers, saws, awls, drills, scrapers, files, clamps, thread, string, rope, thongs, vessels, boxes, and bags. The knife is the beaver tooth or shark tooth; the gimlet is the spine of the ray fish; the saw is the jawbone of some rodent; the sandpaper is the skin of the shark, the palate bone of fish, or mollusk shells; the skin scraper is the leg-bone of one of the large ruminants. So all tools for all purposes may be derived, in some way, from the bodies of animals. Von den Steinen was so impressed with the absence of stone in the Mato Grosso and the universality of animal substances for the materials and tools of industrial operations, that he suggests for culture epochs the terms Bone age and Shell age.

IV. PRODUCTS

Zoötechny concerns itself with the productions of its processes and the way in which they enter into the arts of consumption

and enjoyment. Every part of every animal that enters into savage industry is invoked to supply, as just shown, not only the needs, but the artificial wants of the savage.

Looking at a modern house, it is easy to see that it is divided into cellars or storage places, kitchens or cooking places, dining-rooms or eating places, parlors or places for social intercourse, and bedrooms or places for rest. Though these do not exist in differentiated form among savages, in every tribe of North America, however rude, there was something answering to them. The great variety of food called for an equally great variety of cooking, and so the fireplace and its surroundings, with reference to animal food, gave rise to a multitude of arts. In one place, it is roasting; in another, cooking with hot stones; in the third, in pits; in the fourth, by means of pottery, and so on through the list. The serving of food calls for eating and drinking utensils of horn, shell, hide, and bone. The Eskimo makes a dipper from the tusk of a fossil elephant; the Haida, from the horn of the Rocky Mountain sheep, the handle of which is from the horn of the goat; the buffalo horn served well the Indians of the plains; the clam shell, the eastern tribes; the turtle shell, the western tribes; the conch shell, the middle American tribes. In large areas of the western hemisphere no pottery exists, and some portions of the animal frame take the place of vessels made from that material elsewhere.

The furniture of the social room and the bedroom are made from animal integuments. The Eskimo crawls into his sleeping-bag of fur; the west-coast man wraps himself in his blanket of mountain-goat hair; the plains Indian could not live without his buffalo robe; the eastern Indian lay down in his bear skin.

In southwestern United States everywhere the babe was enfolded in a robe of rabbit skin, and even in those parts of South America where the climate requires no clothing the Indian appears decorated with beautiful cinctures of feathers and wearing hats and collars of animal teeth. Finally, at the extreme south-

ern portion of South America the robe of a guanaco skin and the plumage of the ostrich complete the habiliment.

The house itself shares this dependence on animal materials. The Eskimo, lacking timber, supports his roof with the jawbones of whales, and in summer, in common with his Canadian neighbors, he dwells under rude skin tents. Southward, in woodless areas, the conical tipi is the house, and in Patagonia it is the toldo of guanaco skin. The textile of hair and quill, furnished by innumerable birds and by porcupines, dogs, sheep, and notably by the llama, vie with basketry, pottery, and sculpture in giving expression to the highest esthetic and mythic ideals.

V. SOCIOLOGY

The fifth inquiry concerns the relation of zoötechny to sociologic problems. Society was organized among the aborigines of America on the basis of the animals. Even among the agricultural Indians of the pueblo region this is true. Again, scarcely an industry relating to the treatment of animals was based on individual action; men were fowling, fishing, and hunting together. Much of the apparatus could not be managed by any individual, and even where such a weapon as the harpoon or bird-spear was employed, men hunted with ease in groups.

The driving and corraling of game required coöperation. Dupratz, Lawson, La Hontan, Charlevoix, Loskiel, Perrot, John Smith, Roger Williams, and Champlain all speak with enthusiasm of hunting excursions by entire villages. Von den Steinen mentions the same method of coöperation among the people of the Mato Grosso in South America, and even now in the backwoods of the United States game and fish driving for sport is practiced.

Also, in this connection must be noticed that important study of the division of labor. Men usually attended to the more difficult portions of the work, while the women made the preparations, cooked the food, manufactured the clothing, and took care of the spoils of the hunt.

Bandelier speaks of communal hunts both in New Mexico and Peru, which he characterizes as wholesale slaughter, in the most cruel manner, of all the game within the area encompassed. The meat was distributed among households and a portion was put away for a rainy day. The pueblo peoples also laid in communal stores; small tracts were cultivated for that purpose and the crops were housed in advance of the individual ones. General Dodge in *Our Wild Indians* grows excited over the annual fall hunt of the Siouan people.

In the last chapter will be shown how sociology joins with religion in fixing zoölogical conceptions on tribal life.

VI. KNOWLEDGE

In all the processes of zoötechny human intelligence has been enlarged and strengthened. The ever-increasing wariness of the animal calls for an increasing ingenuity and intelligence on the part of the hunter.

It is a fact that in every one of the eighteen environments mentioned in this paper the savage people knew the best thing for every purpose: the best substance for clothing, the best wood for the bow, for the spear, the arrow, etc.; and it is astonishing to find what a large vocabulary exists in each one of them for different forms of animal life and different parts of the animal's body. For every thought in this direction there must of course be a word or a form of speech. Therefore, language has been assisted materially in its development by the imitation of the animal, by the processes and the life of the hunter, and by all the industries associated therewith. The acquisition of knowledge through experience and the expression of this knowledge in words have been fostered largely by associations with animal life. Half the words of any primitive language are derived from man's association with beastkind.

Finally, the inventive faculty, which after all is the differentiating element between man and the brute, has been stimulated

in the devising of property, means of capture, and tools for handling animal substances. The truth has gradually emancipated itself from the overgrowth of the imaginary, and an aboriginal empirical science of no mean proportions has been elaborated.

VII. RELIGION

Finally, in lower forms of religion and mythology, zoötheistic conceptions are prominent. Every creature is somebody. The animal world lies very near to human actions. Nearly half the totemic names gathered by Mr Hodge among the Pueblo Indians are those of animals.

The folklore and mythology of zoötechny would require a separate paper. Every tribe has its long and delightful faunal myths. Even in the pursuit of animals there are folk customs and folk beliefs that form a part of the history of religion.

The California Indians, after the acquisition of iron knives, still insisted, for superstitious reasons, on using flint and jasper flakes to cut and skin salmon, especially the first in the season. Fisher says that the wooden hunting hats of the sea-otter hunters, south of the Alaskan peninsula, are highly prized because they have the power of attracting the game, and a hunter who would part with his hat would lose his luck. Matthews in his *Mountain Chant* speaks of the old Navaho hunter taking four good sweats and lining the floor of the sudatory with the branches of sweet-smelling trees. Parkman saw an Ogalala Sioux consulting an enormous black cricket as to the position of the buffalo. Of this lore there is no end.

The Eskimo have not the gentile system, but on all their masks as well as in their carvings and etchings the overpowering influence of animal life is apparent. Among the stocks of the western coast down to Vancouver island the one obtrusive feature of the life is the totem post, the totem carving, etching, and painting, with nearly every motive from the animal kingdom. Of the Indians of the United States and Canada the following

list will convey some idea of the source of all mythological conceptions:

<i>Tribe</i>	<i>Clans or Gentis</i>	<i>Animal Totems</i>
Carriers (Athapascan).....	4	4
Navaho ¹ ".....	51	0
Apache ² ".....	34	0
Seneca (Iroquoian).....	8	8
Onondaga ".....	8	7
Cayuga ".....	8	7
Oneida ".....	3	3
Mohawk ".....	3	3
Wyandot ".....	8	8
Tuskarora ".....	8	8
Cherokee ".....	8	3
Mohegan (Algonquian).....	11	11
Ojibwa ".....	23	23
Potawatomi ".....	15	14
Miami ".....	10	7
Shawnee ".....	13	13
Sauk ".....	14	10
Bloods ".....	5	5
Piegau ".....	8	1
Delaware ".....	34	not given.
Abnaki ".....	14	14
Ponka (Siouan).....	8	6
Omaha ".....	12	7
Iowa ".....	8	8
Oto ".....	8	8
Kansa ".....	14	14
Winnebago ".....	8	7
Mandan ".....	7	4
Minitari ".....	7	2
Crow ".....	12	5
Creek (Muskhogeau).....	22	13
Choctaw ".....	8	1
Chickasaw ".....	12	8
Pawnee (Caddoan).....	6	6
Shoshoni (Shoshonean).....	6	6
Tlinkit (Koluschan).....	10	10
Hopi (mixed stock).....	87 (+)	48
Pueblo ³ (several stocks).....	84	34

¹ See Matthews, *Navaho Legends* (*Memoirs Am. Folk-lore Society*, 1897, p. 31) and *Journal of American Folk-lore*, vol. III, 1890, pp. 89-110.

² Bourke in *Journal of American Folk-lore*, vol. III, 1890, pp. 111-126.

³ The Pueblo stocks included are the Tanoan, Keresan, and Zuni. See Hodge, *Pueblo Indian Clans* (*American Anthropologist*, vol. IX, 1896, pp. 345-352), and Bourke, *Snake Dance of the Moquis of Arizona*, New York, 1884.

A PAWNEE RITUAL USED WHEN CHANGING A MAN'S NAME

By ALICE C. FLETCHER

Why an Indian changes his name after any important achievement, and why he never uses the personal name when addressing another, has not yet been fully explained ; therefore any first-hand information relating to this subject will undoubtedly be welcome to students of anthropology. In this connection I take pleasure in presenting a ritual used by three divisions of the Pawnee, the Chau-i', Kit'-ka-hah-ki, and Pita-hau-i'-rat, when the ceremony of changing a man's name takes place.

A few words are fitting on two points, namely, as to how this ritual was obtained, and as to the source from which it was procured.

The difficulty of obtaining rituals used in Indian ceremonies is well known. The priests will not talk of these sacred utterances to strangers, much less recite them for record, so that in order to secure such material one must be in peculiar and confidential relations with its keepers, and be known and trusted by their people. As to the ritual to be presented, the following are the facts:

The father of Mr Francis La Flesche, my collaborator, was the former head-chief of the Omaha tribe, and during his whole lifetime was in official and intimate private relations with the chiefs, the priests, and other prominent men of the Pawnee tribe, where his memory is still green in the hearts of those who knew him. It occurred to his son to make use of his father's hold on the confidence and affection of these people in the attempt to induce some of the priests to impart a knowledge of the ancient

rites of the tribe, that they might be preserved as a part of the history of the American race.

For many years both Mr La Flesche and myself have been aware of the store of wealth hidden in the sacred ceremonies of the Pawnee, and have sought means to rescue it from impending loss. This year we were happy in being able to avail ourselves of the coöperation of Mr James R. Murie, an educated Pawnee, known to us for over sixteen years. He brought to Washington, as our guest, a venerable priest who had never before been east of the Mississippi, and was now induced to make the long journey in his old age that he might honor the memory of his early friend, the head-chief of the Omaha, by placing in the keeping of the son some knowledge of the fast-disappearing ceremonies of his tribe.

This priest was the principal keeper of a certain cult of the Pawnee, but its elaborate ceremonies and rituals formed only a part of the wealth stored in his tenacious memory. He was versed in the traditions and customs of his people, as well as in the usages of several quasi-religious societies of which he was a member. He was a man of much natural ability, mentally alert, quick to observe, and gifted with boundless patience and good nature. While he was childlike and trusting, he had a keen discernment of character, and a shrewd, common-sense way of looking at men and things. He was not indifferent to the changes that have overtaken his race, changes which have swept away the old landmarks and imposed on the people new modes of living and forced them to new ways of thinking; but these unmistakable indications of the rapidity with which aboriginal conditions are dying out failed to disconcert him, and even when they were augmented by fresh evidences, which daily confronted him at the capital, of the resources and dominant power of the white race, the convictions implanted in his mind by his religious training remained undisturbed.

When urged to take up his abode in a frame cottage on the

reservation that he might enjoy more personal comfort than was possible in the primitive conditions in which he lived, he said: "I cannot live in a white man's house of any kind. The sacred articles committed to my care must be kept in an earth lodge, and in order that I may fulfil my duties toward them and my people, I must live there also, so that as I sit I can stretch out my hand and lay it upon mother earth."

While the vastness and the beauty of the Capitol and the Library of Congress gave him pleasure, they did not appeal to him, for such buildings, he said, were unfitted to contain the sacred symbols of the religion of his ancestors, in the service of which he had spent his long life.

He admired at a distance the Washington monument, and when we visited it he measured the base, pacing and counting his steps. Then he stood close to the white shaft and looked up, noting its great height. We went inside, and when asked which he would take, the elevator or the stairs, he replied: "I will not go up. The white man likes to pile up stones, and he may go to the top of them; I will not. I have ascended the mountains made by Ti-ra'-wa."

Equally characteristic was his interview with the Commissioner of Indian Affairs. When introduced, he said: "I am glad to see you and to take you by the hand. Many chiefs of my tribe have done so; I never expected to do it. I have nothing to ask of you; nothing to tell you. I came here to talk of the religion of my fathers which I follow. You can ask my sister [referring to me] what I have said."

The weeks spent with this old man will ever be memorable. He illustrated the persistency of belief, and the dignity of unwavering trust in the power and care of the gods of his fathers. Of the genuineness of his statements there can be no doubt. He had not in the least been thrown off his mental balance by the insistence of his new and strange surroundings. While he had been forced to conform to some of our modes of living, the

atmosphere of his mind was seemingly unaffected by the culture of our race. His unquestioning faith in the religion of his forefathers soared far above the turbulent conditions of today, and gave to him a calm akin to the serenity of childhood, which was reflected in his kindly, smiling, and peaceful face. His name was Ta-hi'-roos-sa-wi-chi, and he belonged to the Chau-i' division of the Pawnee.

The priest, having first engaged in silent prayer, intoned the ritual, of which a graphophone record was taken.

The words were separated into syllables. Sometimes an entire word or parts of two words were represented by a single syllable, and each syllable in the ritual was uttered as though it was a complete word. Rather a high pitch was taken for the recital, probably from habit, as the ritual was always given in the hearing of a great multitude.

Mr Murie and I spent three days in the translation and study of the ritual, assisted by the priest, who explained to us many points that were somewhat obscure, owing to elisions, the employment of a single word as a mnemonic to call up the picture of a complicated action, and the forcing of words to a different application from that of ordinary speech—a not uncommon occurrence in rituals. He carefully watched our work step by step, lest we should fall into mistakes, remarking that the ritual “speaks of the powerful gods of whom man should be careful what he says.” The translation represents much painstaking labor on the part of Mr Murie, whose intelligent interest in the history of his tribe is worthy of record, and bids fair to bear fruit in the near future.

There is one aspect of the ritual, essential to its understanding, that was very carefully studied by us, and I will give the gist of many conversations on the subject. The priest explained that a man's life is an onward movement. If one has within him a determined purpose and seeks the favor of the gods, his life will “climb up.” Here the priest made a gesture indicating a line

slanting upward; then he arrested the movement, and, still holding his hand where he had stopped, went on to say that, as a man is climbing up, he does something that marks a place in his life where the gods have given him the opportunity to express in acts his peculiar powers, so this place, this act, forms a stage in his career, and he takes a new name to indicate that he is on a level different from that which he occupied previously. Some men, he said, can rise only a little way, others live on a dead level, and he illustrated his words by moving his hands horizontally. Men having power to advance, climb step by step, and here again he made his idea plain to us by a gesture picturing a slant, then a level, a slant, and a level. In this connection he called our attention to the words, in the first movement of the ritual, *ru-tu'-rah-wits pa'-ri*, "to overtake walking," saying that the people who desire to have a name, or to change their name, must strive to overtake in the walk of life an upper level, such a one as these ancient men spoken of in the ritual had reached, and where they threw away the names by which they had been known before. "*Ru-tu'-rah-wits pa'-ri*" is a call to the Pawnee bidding them emulate these men and overtake them by the doing of like deeds.

Without entering into a dissertation concerning the meaning of Indian names, or into a detailed description of the Pawnee ceremonial of bestowing them, which could be performed by itself, or as a sort of episode in some other ceremony, three facts connected with the Pawnee custom of taking a name should be stated:

First—A man was permitted to take a name only after the performance of an act indicative of great ability or strength of character, such as prowess, generosity, prudence, courage, or the like.

Second—The name had to be assumed openly, before the people to whom the act it commemorated was known.

Third—It was necessary that it should be announced by a priest in connection with such a ritual as we are about to consider.

These three facts indicate (1) that a man's name stood for what he had shown himself to be in the light of his action; (2) this was recognized by his tribesmen; and (3) it was proclaimed by one having in charge the mediatory rites through which man could be approached by the supernatural. With these three facts in mind we will examine the ritual.

Three dramatic movements are expressed in it, but they cannot be treated separately as they are closely interdependent.

The first movement gives a brief narration of the institution of the custom of changing the name in consequence of some new achievement.

The second shows how the man was enabled to accomplish this act. It begins with his lonely vigil and fast, when he cried to the gods for help. The scene then shifts to the circle of the gods, who in council deliberate on the petition which makes its way to them and gains their consent. Then the Winds summon the messengers, and these, gathering at the gods' command, are sent to earth, to the man crying in lonely places, to grant his desire. The movement closes with a few vivid words which tersely set forth that only by the favor and help of the gods had the man been able to do the deed.

The third deals with the man's names—the one to be discarded and the one now to be assumed.¹

THE RITUAL

- 1 Hi-ri! Wá-ku'-ra-ru-ta sha-ru wi-ti ra-ra-wa-a ki-ru sha-ru re-ru
kit-a-wi Rah-wi-rah-ri-so ti-ra kah-ho ri-wi-ri.
- 2 Hi-ri! Rá-ru kit-a-wi Rah-wi-rah-ri-so ra-hoo ti shi-ra ru-tu-rah-
witz pa-ri u-sa-ru i re.
- 3 Hi-ri! Ra-ru kit-a-wi Rah-wi-rah-ri-so ra-hoo ti shi-re-ra kit-a-wa
u-sa-ru.
- 4 Hi-ri! Ri-ru-tzi-ra-ru; ra-sa roox-sa pa-ka-ra-ra witz pa-ri, Hi-ri!
ti-ru-ta, Hi-ri! ti-ra-koose ta-ra-ra-wa-hut, ti-ri.

¹ The termination of one movement and the beginning of another are indicated to the eye by extra spacing between the third and fourth, and the eleventh and twelfth lines.

- 5 Hi-ri! Ri-ru-tzi-ra-ru; ra-sa roox-sa pa-ka-ra-ra witz pa-ri, Hi-ri!
ti-ru-ta; Hi-ri! Ti-ra-wa, Ha! ti-ri.
- 6 Hi-ri! Ri-ru-tzi-ra-ru; si-ra wa-ku ri-ka-ta i-wa-hut, Hi-ri! ti-ru-
ta, Hi-ri! ti-ra-koose ti-ra-ra-wa-hut, ti-ri.
- 7 Hi-ri! Ri-ru-tzi-ra-ru; si-ra wa-ku ra-ri-sut, Hi-ri! ti-ru-ta, Hi-
ri! Ti-ra-wa, Ha! ti-ri.
- 8 Hi-ri! Ri-ru-tzi-ra-ru; Ra-ra-ri-tu, ka-ta wi-tix-sut-ta.
Ra-ki-ris ta-ka-ta wi-tix-sut-ta.
Ra-ki-ris ta-ru-koox-pa, ra-ru-tu-ra tu-ka-wi-ut ta-ri.
- 9 Hi-ri! Ri-ru-tzi-ra-ru; ru-ri Pa-pa-pi-chus ta-ka wi-tix-sut-ta.
Ru-ri Pa-pa-pi-chus ta-ru-koox-pa ra-ru-tu-ra tu-ka-wi-ut ta-ri.
- 10 Hi-ri! Ri-ru-tzi-ra-ru; ru-chix ku-so-ho ri-ra-ka-ta koox-sa-ta,
Ka-ha-ri-wi-si-ri, ku ka-tit ti-ki; Ka-ha-ri-wi-si-ri, ku pa-ha-ti
ti-ki; Ka-ha-ri-wi-si-ri, ku ra-ka-ta ti-ki; Ka-ha-ri-wi-si-ri, ku
ta-ka ti-ki.
- 11 Hi-ri! Ri-ru-tzi-ra-ru; si-ra su-ra wa-u-rux pa-ra, ra-ru-tu-ra
tu-ka-wi-ut ta-ri.
- 12 Ra-wa! Ha-wa u-ra-sha-ru we tat-ki-wa-ti.
- 13 Hi-ri! Ta-tux ta-pa-ki-a-ho, ha-wa, Ra-ruts-ka-tit! Hi-ri! Ra-ro
rik-cha ro re.
- 14 Hi-ri! Wa-ko-ru ra-to-ra pa-ke-oos-to.
- 15 Hi-ri! A-ki-ta-ro hi-wa we-ra-ta-we-ko.
- 16 Hi-ri! Sha-ku'ru Wa'ruk-ste. Hi-ri-wa wi-ti ra-ka-wa-ka-ru
ko re.

The following verbal translation is by Mr Murie, in which no attempt has been made to treat the ritual from a linguistic point of view, or to enter into the peculiar use and composition of the words.

VERBAL TRANSLATION¹

- 1 *Hi-ri*—an exclamation; Harken! Give heed!
wá-ku'-ra-ru-ta—it came to pass a long time ago.
sha'-ru—from *u'-ra-sha'-ru*, name.
wi-ti—they.
ra-ra-wa-a—discarded, had done with, threw away.
ki'-ru—ancient.
sha'-ru—from *koos-sha-ru*, a certain place known only by tradition.
ré-ru—it was, or it came about.

¹ The vowels have the continental sound. A at the end of a syllable means that the breath must be heard. A dot over a vowel flattens the sound. The *r* has a slight trill.

kit'-a-wi—from *ki*, through, and *ta'-wi*, them.

Rah-wi'-rah-ri-so—a Leader, one entitled to carry the sacred corn by virtue of having passed through certain rites.

ti'-ra—they.

kah-ho—a wide expanse; *kah* conveys the picture that this expanse is spanned as by a roof; *ho* suggests an enclosed space, as a dwelling; *kah-ho* calls up the idea that the earth is a vast abode roofed by the heavens, where dwell the gods.

ri'-wi-ri—walking, spoken of persons not present. *Ra-ra'-wa-ri* is to travel (walking) like warriors, and the word in the text refers to such walking, to the *Rah-wi'-rah-ri-so* and the men under his leadership walking the wide earth beneath the arching sky.

2 *Hi-ri*—harken.

ra'-ru—a company or a number of persons.

kit'-a-wi—through them.

Rah-wi'-rah-ri-so—the Leader.

ra'-hoo—a class of songs that could be composed and sung only by a successful leader; a Victory song.

ti—from *ti'-ra*, they.

shi-ra—from *shi-re'-ra*, brought; the *re* eliminated for euphony.

ru-tu'-rah-wits—overtake.

pa-ri—walking; singular, present tense.

u-sa'-ru—a place where something occurred known only by a tradition preserved in song.

i re—singing vocables.

3 *Hi-ri*—harken.

ra'-ru—a number of persons. The word here refers both to the Leader and his men, and to the people of their village.

kit'-a-wi—through them. Another double reference like the former.

Rah-wi'-rah-ri-so—the Leader.

ra'-hoo—the Victory song.

ti—they.

shi-re'-ra—brought.

kit'-a-wa—from *kit*, top; *ta*, coming; *wa*, from *wa'-ku*, hill; this composite word conveys the picture of the returning men bringing their Victory song and singing it as they reach the top of the hill near their village.

u-sa'-ru—the word here means that the Victory song commemorated the event, after which the Leader instituted the custom of changing the name.

(These three lines constitute the first movement of the ritual.)

4 *Hi-ri*—harken.

ri-ru'-tsi-ra-ru—by reason of, by means of, because of. This word has a wide significance and controlling force in the ritual.

ra'-sa—the man stood.

roox-sa—he said or did.

pa-ka-ra'-ra—a loud call, sending the voice to a great distance.

wits—from *ta-wits'-sa*, to reach or arrive.

pa-ri—traveling. These five words stand for a religious rite performed by the man, or Leader. The first two tell that he went alone to solitary places to fast and pray, seeking to secure the favor of the gods; the last three describe how his voice, bearing his petition, traveled on and on, striving to reach the gods' abode.

Hi-ri—a call for reverent attention.

ti'-ru-ta—special or assigned places, referring to the abodes or places where the lesser gods dwell, assigned there by *Ti-ra'-wa*, the highest power, the one over all.

Hi-ri—reverent attention demanded.

ti'-ra-koose—sitting; present tense, plural.

ta-ra-ra-wa'-hut—a term for sky, or heavens; it implies a circle, a great distance, and the dwelling place of those beings which, for the lack of a better name, we call gods.

ti-ri—above, up there, as if the locality were designated by pointing upward.

5 *Hi-ri*—harken.

ri-ru'-tsi-ra-ru—because.

ra'-sa—the man stood.

roox-sa—did.

pa-ka-ra'-ra—send voice to a distance

wits—reached.

pa-ri—traveling.

Hi-ri—call for reverent attention.

ti'-ru-ta—abodes of the lesser gods.

Hi-ri—reverent attention.

Ti-ra'-wa—the supreme god.

Ha—an exclamation of awe.

ti-ri—above all.

6 *Hi-ri*—harken.

ri-ru'-tsi-ra-ru—by reason of.

si'-ra—they took.

wa'-ku—they said.

ri'-ka-ta—received.

i-wa'-hut—from *i-wa*, to hand over or pass on to the one next ; and *ta-ra-we-hut*, the circle above in the heavens ; the word means handed or passed around the circle.

Hi-ri—reverent exclamation.

ti'-ru-ta—abodes of the gods.

Hi-ri—reverent attention asked for.

ti'-ra-koose—sitting.

ti-ra-ra-wa'-hut—circle in the heavens.

ti-ri—up above.

7 *Hi-ri*—harken.

ri-ru'-tsi-ra-ru—because of.

si'-ra—they took.

wa'-ku—they said.

ra-ri'-sut—gave consent ; granted.

Hi-ri—call for reverent attention.

ti'-ru-ta—abodes of the lesser gods.

Hi-ri—reverent attention.

Ti-ra'-wa—the supreme god.

Ha—exclamation of awe.

ti-ri—above all.

8 *Hi-ri*—harken.

ri-ru'-tsi-ra-ru—by means of.

Ra-ra-ri'-tu—an old term for Winds ; it also means heavy storm-clouds. *Ra-ri'-tu*, a cyclone. The word in the text has a double significance ; it stands for Winds, and for the summoning by the Winds of the storm-clouds.

ka'-ta—rising up, climbing up.

wi'-tix-sut-ta—reached there.

Ra-ki'-ris—plural form, Thunders.

ta-ka'-ta—ascending, advancing upward.

wi'-tix-sut-ta—reached a given place.

Ra-ki'-ris—Thunders.

ta-ru-koox'-pa—an action concluded.

ra-ru'-tu-ra—from *ra-ru*, at that ; and *tu-ra*, ground ; the word means that at the conclusion of the action (here understood) they descended to the earth.

tu-ka'-wi-ut—slantwise.

ta-ri—the end of a mission or of an action.

9 *Hi-ri*—harken.

ri-ru'-tsi-ra-ru—by means of, or by the agency of.

ru-ri—at that time.

Pa-pa-pi'-chus—Lightning ; *pa-pa*, zigzag ; *pi'-chus*, darting, flashing.

ta-ka—within, enclosed.

wi'-tix-sut-ta—reached there.

ru-ri—at that time.

Pa-pa-pi'-chus—Lightning.

ta-ru-koox'-pa—an action concluded.

ra-ru'-tu-ra—and then, they descended to earth.

tu-ka'-wi-ut—slantwise.

ta-ri—the end of their mission.

10 *Hi-ri*—harken.

ri-ru'-tai-ra-ru—by means of.

ru-chix—they did.

ku-so'-ho—flock.

ri-ra-ka'-ta—in front of.

koox'-sa-ta—from side to side, as when ranging a path.

Ka-ha'-ri-wi-si-ri—Swallows.

ku—breast.

ka-tit—black.

ti-ki—they were.

Ka-ha'-ri-wi-si-ri—Swallows.

ku—breast.

pa-ha'-ti—red.

ti-ki—they were.

Ka-ha'-ri-wi-si-ri—Swallows.

ku—breast.

ra-ha'-ta—yellow.

ti-ki—they were.

Ka-ha'-ri-wi-si-ri—Swallows.

ku—breast.

ta'-ka—white.

ti-ki—they were.

11 *Hi-ri*—harken.

ri-ru'-tai-ra-ru—because.

si'-ra—they took, refers to the Leader and to the men who followed and depended on him.

su-ra—possess, to become one's own.

wa-u-rux'—grasped, as a staff.

pa'-ra—walked.

ra-ru'-tu-ra—refers to that which descended to earth.

tu-ka'-wi-ut—slantwise.

ta-ri—end, or accomplished mission.

(The second movement of the ritual here comes to an end)

- 12 *Ra'-wa*—A call for attention, at the moment.
ha'-wa—once more.
u-ra-sha-ru—name.
we—I.
tat-ki'-wa-ti—change.
- 13 *Hi-ri*—harken.
ta-lux—we used to.
ta-pa-ki-a-ko—speak of him.
ha'-wa—once more.
Ra-ruts-ka'-tit—the former name, meaning black-feathered arrow.
Hi-ri—harken.
ra-ro—owner.
rik-cha—lying. These words refer to the achievement commemorated by the name about to be thrown away.
ro re—vocables.
- 14 *Hi-ri*—harken.
wa-ko-ru—now we are.
ra-to-ra—all people.
pa-ke'-oos-to—speak out and say.
- 15 *Hi-ri*—harken.
a-ki-ta-ro—tribe.
hi-wa—in the.
we-ra-ta-we-ko—prominent.
- 16 *Hi-ri*—harken.
Sha-ku'-ru Wa'-ruk-sit—the new name now announced ("Sacred Sun").
hi-ri-wa—in the process of making.
wi-ti—himself.
ra-ka-wa'-ka-ru—what he is.
ko re—vocables.

This dramatic poem is in a rhythmic form impossible to reproduce in English. Our language does not permit of the treatment which the Pawnee tongue receives in the ritual; there, words are cut apart, combined, or represented by a single syllable in order that the rhythmic flow may be uninterrupted.¹ Neither is a literal

¹ Mr John B. Dunbar, an authority on the Pawnee language, writes: "It [the language] may rightfully challenge eminent position for its beauty as well as for its detailed flexibility. Even in its daily use careful attention is given to the euphonic element, in the employment of euphonic syllables, in the omission of syllables or letters, and in the substitution of letters; while its system of verbal inflection frequently admits of the compendious expression of shades of meaning which has usually quite

translation adequate to convey the meaning of the ritual. A single word sometimes represents a complex action, to the understanding of which a knowledge of the customs and the beliefs of the tribe is essential. The terseness of expression was also intended to close the meaning to the uninitiated, keeping it as sacred from the common people. Take, for example, the fourth stanza, which in Pawnee contains thirty-five syllables representing thirteen words. Literally translated these would read: "Harken by reason of the man stood said and did loud call to reach traveling Harken special places Harken sitting circle above." These words were explained and amplified by the priest exactly as is given in the close translation of the same stanza. By the light of this amplification the words of the ritual, otherwise unintelligible, become full of meaning to anyone familiar with the customs and thought of the tribe. The same is true of every other stanza given in the following close translation. I have deemed it proper to throw this translation into rhythmic form that something like its native cadence may be preserved. My aim has been to present the ritual, inadequately it is true, as it appealed to the thoughtful and reverent Pawnee.

CLOSE TRANSLATION

- 1 Harken ! 'Twas thus it came to pass :
 In ancient days, a Leader and his men
 Walked this wide earth, man's vast abode
 Roofed by the heavens, where dwell the gods.
 They reached a place, the spot no man can tell,
 Faced dangers dread, and vanquished them ;
 Then, standing as if born anew to life,
 Each warrior threw away the name
 That had been his ere yet these deeds were done.
- 2 Harken ! The Leader and his men
 Made there the Vict'ry song, and set the mark
 Ye must o'ertake, if ye would be like them !

disappeared from the languages of literature." A "special excellence"—in certain compositions—"with the Pawnee seems often to consist in its intense brevity."—Grinnell, *Pawnee Hero Stories and Folk-Tales*, app., pp. 409, 435.

3 Harken! The Leader and his men
Turned then toward home. Their Vict'ry song
Proclaimed them near; the village rose,
Looked toward the hill, where on the top
Stood the brave men, singing their song,
Heralding thus the favor of the gods
By which they had surpassed all former deeds,—
Made new their claim to be accounted men.

4 Harken! And whence, think ye, was borne
Unto these men, courage to dare,
Strength to endure hardship and war?
Mark well my words, as I reveal
How the gods help man's feebleness.
The Leader of these warriors was a man
Given to prayer. Oft he went forth
Seeking a place no one could find.
There would he stand and lift his voice
Fraught with desire, that he might be
Invincible, a bulwark 'gainst all foes
Threat'ning his tribe, causing them fear.
Night-time and day this cry sped on,
Traveling far, seeking to reach—

Harken! Those places far above,

Harken! Within the circle vast

Where sit the gods, watching o'er men.

5 Harken! This poor man's prayer went on,
Speeding afar into the blue
Heavens above, reached there the place—
Harken! Where dwell the lesser gods,
Harken! And great Ti-ra'-wa, mightier than all!

6 Harken! It was because a god
Received this prayer, considered it,
Favored its plea, and passed it on
To him whose place was next, in that grand ring,
Who, in his turn received the prayer,
Considered it, and sent it on—
Harken! Around that circle vast,
Harken! Where sit the gods above.

- 7 Harken ! And thus it was the prayer
Sent by this man, won the consent
Of all the gods. For each god in his place
Speaks out his thought, grants or rejects
Man's suppliant cry, asking for help ;
But none can act until the Council grand
Comes to accord, thinks as one mind,
Has but one will, all must obey.
Harken ! The Council gave consent ;
Harken ! And great Ti-ra'-wa, mightier than all !
- 8 Harken ! To make their purpose known,
Succor and aid freely to give,
Heralds were called, called by the Winds.
Then in the west uprose the Clouds
Heavy and black, laden with storm.
Slowly they climbed, dark'ning the skies ;
While close on every side the Thunders marched
On their dread way, till all were come
To where the gods in stately council sat
Waiting for them. Then, bade them go
Back to the earth, carrying aid
To him whose prayer had reached their circle vast.
This mandate given, the Thunders turned toward earth,
Taking their course slantwise the sky.
- 9 Harken ! Another followed hard—
Lightning broke forth out of the cloud,
Zigzag and dart, cleaving their way
Slantwise to earth, their goal to reach.
- 10 Harken ! For these two were not all
That hastened to proclaim the gods' behest—
Swift on their wings, Swallows in flocks
Swept in advance, ranging the path,
Black breasts and Red, Yellow, and White,
Flying about, clearing the way
For those who bore the message of the gods
Granting the man courage to dare,
Strength to endure, power to stand
Invincible, a bulwark 'gainst all foes.

- 11 Harken ! 'T was thus it came to pass :
The Leader grasped the help sent by the gods ;
Henceforth he walked steadfast and strong,
Leading his men through dangers drear,
Knowing that naught could strike at him
To whom the gods had promised victory.
- 12 Attend ! Once more I change his name.
- 13 Harken ! *Ri-ruts'-ka-tit* it was
We used to call him by, a name he won
Long days ago, marking an act
Well done by him, but now passed by.
- 14 Harken ! Today all men shall say—
- 15 Harken ! His act has lifted him
Where all his tribe behold a man
- 16 Clothed with new fame, strong in new strength,
Gained by his deeds, blessed of the gods.
Harken ! *Sha-ku'-ru Wa'-ruk-ste* shall he be called.

From the teaching of this ritual it appears—

First—That a man's name marked an epoch in his life, the accomplishment of something in which both gods and men had borne a part, and that as his life progressed and new achievements were gained, a memorial was established by his taking a new name.

Second—That so personal and sacred a meaning was attached to a name as to render it unfit for the familiar purposes of ordinary address, to a people as reverently inclined as the Indians seem to have been.

SOME RECENT CRITICISMS OF PHYSICAL ANTHROPOLOGY

By FRANZ BOAS

During recent years a number of severe attacks against the methods of physical anthropology have been made, which are directed mainly against two points—(1) the possibility of classifying mankind according to anatomical characteristics, and (2) the practicability of description of types by means of measurements.

Before we attempt to reply to these criticisms, it may be well to make a few brief remarks on the development of the methods of physical anthropology. The living representatives of the various races of man were originally described according to their general appearance,—the color of the skin, the form and color of the hair, the form of the face, etc. Later this general description was supplemented by the study of the skeletons of various races, and a number of apparently characteristic differences were noted. One of the principal reasons that led to a more detailed study of the skeleton and to a tendency to lay the greatest stress upon characteristics of the skeleton, was the ease with which material of this kind could be obtained. Visitors to distant countries are likely to bring home skeletons and parts of skeletons, while not much opportunity is given for a thorough examination of a considerable number of individuals of foreign races. The difficulty of obtaining material relating to the anatomy of the soft parts of the body has had the effect that this portion of the description of the anatomy of man has received very slight attention. In comparatively few cases have we had opportunity to make a thorough study of the characteristics of the soft parts of the body of individuals belonging to foreign races. The desire to find

good specific characters in the skeleton has also been stimulated by the necessity of studying extinct races. The conditions in these cases are the same as those found in paleontological studies, where the osseous remains alone of extinct species are available. Researches into the earliest history of man must be based on studies of the skeleton.

Studies of the human skeleton had not been carried very far when it was found to be not quite easy to determine racial characteristics with sufficient accuracy by mere verbal description. This led to the introduction of measurements as a substitute for verbal description. With the increase of the material, the necessity of accurate description became more and more apparent, because intermediate links between existing forms were found with increasing frequency. These conditions have led to a most extensive application of the metric method in the study of the human skeleton and also in the study of the external form of the living.

The results of the minute studies that have been carried on in this manner appear discouraging to many students, because we have not been able to find any criterion by which an individual skeleton of any one race can be distinguished with certainty from a skeleton belonging to another race, except in a very general way. A typical full-blood negro may be distinguished from a white man, and an Indian of Florida from an Eskimo; but it would be difficult to distinguish the skeleton of a Chinaman from that of certain North American Indians.

This lack of definite individual descriptive features has led many investigators to conclude that the method is at fault, and that the skeleton cannot be used as a satisfactory basis for a classification of mankind. This view has been strengthened by the belief, frequently expressed, that the characteristic features of each race are not stable, but that they are influenced to a great extent by environment, geographical as well as social.

It seems to me that these views are not borne out by the

observations that are available. The first objection, which is based on the lack of typical characteristics in the individual, does not take into consideration the fact that anthropological study is not a study of individuals, but of local or social varieties. While it may be impossible to classify any one individual satisfactorily, any local group existing at a certain given period can clearly be characterized by the distribution of forms occurring in that group. I do not hesitate to say that, provided we had satisfactory statistics of the distribution of human forms over the whole globe, an exhaustive description of the physical characteristics of any group of individuals belonging to one locality would enable us to identify the same without any difficulty. This clearly emphasizes the fact that anthropological classification must be considered as a statistical study of local or social varieties. But it will be asked, How does this help in classifying individual forms? The problem must be considered in the following way:

Each social unit consists of a series of individuals whose bodily form depends on their ancestry and on their environment. If the opinion of the critics of physical anthropology regarding the predominant effect of environment is correct, then we cannot hope to make any discoveries as to ancestry of local or social groups by means of anatomical investigations. If, on the other hand, it can be shown that heredity is the predominant factor, then the prospects of important discoveries bearing on the early history of mankind are very bright indeed. It seems to the writer that a biological consideration makes it very probable that the influence of heredity should prevail, and thus far he has failed to find conclusive proof to the contrary.

The critics of the method of physical anthropology will of course concede that a negro child must be a negro, and that an Indian child must be an Indian. Their criticism is directed against the permanence of types within the race; for instance, against the permanence of short or tall statures, or against the permanence of forms of the head. It must be conceded that

muscular development may exert an important influence on the forms of bones, but it does not seem likely that it can bring about an entire change of form. The insufficiency of the influence of environment appears in cases where populations of quite distinct types inhabit the same area and live under identical conditions. Such is the case on the North Pacific coast of our continent; such was the case in successive populations of southern California and of Utah.

While this may be considered good evidence in favor of the theory of predominance of the effect of heredity, the actual proof must be looked for in comparisons between parent and offspring. If it can be shown that there is a strong tendency on the part of the offspring to resemble the parent, we must assume that the effect of heredity is stronger than that of environment. The method of this investigation has been developed by Francis Galton and Karl Pearson, who have given us the means of measuring the degree of similarity between parent and child. Wherever this method has been applied, it has been shown that the effect of heredity is the strongest factor in determining the form of the descendant. It is true that thus far this method has not been applied for series of generations, and under conditions in which a considerable change of environment has taken place, and we look forward to a definite solution of the problem of the effect of heredity and of environment through the application of this method. In the study of past generations we cannot, on the whole, compare directly parent and offspring, but we have to confine ourselves to a comparison between the occurrence of types during successive periods. The best available evidence on this subject is found in the populations of Europe. It does not seem likely that the present distribution of types in Europe can be explained in any other way than by the assumption that heredity had a predominant influence. Much has been made of the apparent change of type that takes place in the cities of Europe in order to show that natural selection may have played

an important part in making certain types of man predominant in one region or another. Ammon has shown that the city population of southwestern Germany is more short-headed than the country population, and concludes that this is due to natural selection. All the phenomena of this character that have been described can be explained satisfactorily by the assumption that the city population is more mixed than the country population. This point has been brought out most clearly by Livi's investigations in Italy, where he has proved that in regions where long-headed forms prevail in the country, in the city the population is more short-headed; while in regions in the country in which short-headed forms prevail, in the city the population is more long-headed.

It seems to me that, under present conditions, it is best in the study of the anatomical characteristics of man not to start from far-reaching assumptions in regard to the question of the effect of heredity and environment, but first of all to ascertain the distribution of types of man. This is a definite problem that requires treatment and investigation just as much as the study of languages or the study of the customs of various tribes. At the present time we are far from being familiar with the distribution of types on the various continents. No matter what the ultimate explanation of the distribution of types may be, we cannot evade the task of investigating their present distribution and of seeking for the explanation of the reasons for such distribution.

Before entering into this subject more fully, it may be well to take up the second criticism of the method of physical anthropology, which has been made with increasing frequency of late years. A number of investigators object to the metric method of anthropology, and desire to bring about a substitution of description for measurements. This proposition is based on a misunderstanding of the function of measurements. The necessity of making measurements developed when it was found that the local varieties of mankind were very much alike—so much so that

a verbal description failed to make their characteristics sufficiently clear. The process by means of which measurements have been selected has been a purely empirical one. It has been found that certain measurements differ considerably in various races, and are for this reason good racial criteria. The function of measurements is therefore solely that of giving greater accuracy to the vague verbal description. It is true that in the course of time a tendency has developed of considering as the sole available criteria of race, the measurements which by experience have been found to be useful. This is true particularly of the so-called cephalic index; that is, the proportion of width to length of head. There are anthropologists who have subordinated everything else to the study of the cephalic index, leaving out of consideration altogether the forms of the skull and of the skeleton as expressed by their metric relation or as expressed by means of drawings or diagrams. It has frequently been pointed out that the same cephalic index may belong to forms that anatomically cannot be considered as equivalent. We find, for instance, that the same cephalic index belongs to the Eskimo, to the prehistoric inhabitant of southern California, and to the negro. Still these three types must be considered as fundamentally different. Anthropologists who limit their work to the mechanical application of measurements, particularly of single measurements, and who try to trace the relationships of races by such means, do not apply the metric method in a correct way. It must be borne in mind that measurements serve the purpose only of sharper definition of certain peculiarities, and that a selection of measurements must be adapted to the purpose in view. I believe the tendency of developing a cast-iron system of measurements, to be applied to all problems of physical anthropology, is a movement in the wrong direction. Measurements must be selected in accordance with the problem that we are trying to investigate. The proportion of length and breadth of head may be a very desirable measurement in one case, while in another case it may be of no value

whatever. Measurements should always have a biological significance. As soon as they lose this significance they lose also their descriptive value.

The great value of the measurement lies in the fact that it gives us the means of a comprehensive description of the varieties contained in a geographic or social group. A table that informs us of the frequency of various forms as expressed by measurements that occur in a group, gives us a comprehensive view of the variability of the group that we are studying. We can then investigate the distribution of forms according to statistical methods; we can determine the prevalent type and the character of its variation. The application of rigid statistical methods gives us an excellent means of determining the homogeneity and the permanence of the type that is being studied. If a group of individuals who present a homogeneous type is not subject to changes, we must expect to find the types arranged according to the law of probabilities; that is to say, the average type will be the most frequent one, and positive and negative variations will be of equal frequency. If, on the other hand, the homogeneous type is undergoing changes, the symmetry of arrangement will be disturbed, and if the type is dishomogeneous we must expect irregularities in the whole distribution. Investigations of this character require the measurement of very extensive series of individuals in order to establish the results in a satisfactory manner. But the character of the distributions that may thus be obtained will furnish material for deciding a number of the most fundamental questions of physical anthropology.

I may now revert to the question previously under discussion. I have tried to show that the metric method may furnish us material proving the homogeneity or dishomogeneity of groups of certain individuals. This test has been applied to a number of cases. I have examined from this point of view the North American half-bloods, that is, individuals of mixed Indian and white descent. I have shown that the transverse development of the

face, which is the most distinctive difference between Indian and white, shows a tendency in the mixed race to revert to either of the parental races, and that there is no tendency toward the development of an intermediate form. Bertillon has shown similar irregularities to exist in France. On the other hand, extensive series of measurements of enlisted soldiers of Italy show in many parts of the kingdom a comparatively homogeneous series. Hand in hand with this phenomenon go remarkable differences of variability. In places where we have reason to believe that distinct types have intermingled, we find a great increase in variability, while in regions occupied by homogeneous populations the variability seems to decrease. These facts are very strong arguments for the assumption of a great permanence of human types. It is necessary that the analysis of distributions of measurements be carried much farther than it has proceeded up to the present time; this done, and I believe we shall obtain a means of determining with considerable accuracy the blood relationships of the geographical varieties of man.

I wish to say a word here in regard to the question of the relationship between the earliest prehistoric races and the present races. Insofar as the reconstruction of the characteristics of prehistoric races can be based on extensive material, there will be a certain justification for a reconstruction of the soft parts, if a detailed comparison of the osteological remains of prehistoric types and of present types proves them to be conformable. Where, however, the similarity is based on a few isolated specimens, no such reconstruction is admissible, because the attempt presupposes the identity of the prehistoric race with the present. Since remains of the earliest man are very few in number, it is hardly possible to gain an adequate idea of what the characteristics of the soft parts of his body may have been.

When we base our conclusions on the considerations presented in this paper, we must believe that the problem of physical anthropology is as definite as that of other branches of anthropol-

ogy. It is the determination and explanation of the occurrence of different types of man in different countries. The fact that individuals cannot be classified as belonging to a certain type shows that physical anthropology cannot possibly lead to a classification of mankind as detailed as does the classification based on language. The statistical study of types will, however, lead to an understanding of the blood relationship between different types. It will consequently be a means of reconstructing the history of the mixture of human types. It is probable that it will lead also to the establishment of a number of good types which have remained permanent through long periods. It will be seen that that part of human history which manifests itself in the phenomena that are the subject of physical anthropology is by no means identical with that part of history which manifests itself in the phenomena of ethnology and of language. Therefore we must not expect that classifications obtained by means of these three methods will be in any way identical. Neither is it a proof of the incorrectness of the physical method if the limits of its types overlap the limits of linguistic groups. The three branches of anthropology must proceed each according to its own method; but all equally contribute to the solution of the problem of the early history of mankind.

PRELIMINARY REVISION OF THE EVIDENCE RELATING TO AURIFEROUS GRAVEL MAN IN CALIFORNIA

By WILLIAM H. HOLMES

FIRST PAPER

INTRODUCTORY

During recent years much has been said and written regarding the antiquity of man in America, and as opportunity has presented I have engaged in the discussion of the subject, endeavoring to determine the exact value of the evidence brought forward by the various observers. By far the strongest body of data tending to establish the existence of a man of great antiquity is that emanating from the gold belt of California, and first brought together by Prof. James D. Whitney and published in his notable work on the Auriferous gravels.¹ There is considerable literature embodying original observations outside of this volume, the most important contribution being a paper by Dr George F. Becker, published in the *Bulletin* of the Geological Society of America for 1891.

For a long time I have entertained the idea of visiting the Pacific slope for the purpose of becoming personally acquainted with the region furnishing the evidence, and with the people, so far as the hand of time has spared them, familiar with the golden era of California. I hoped at least to see enough to enable me to make up my own mind as to the value of the evidence, and it seemed within the range of possibility that something decisive in the way of new evidence, or of side lights on the old, might de-

¹ J. D. Whitney, *The Auriferous Gravels of the Sierra Nevada of California*, Cambridge, 1879, vol. vi, No. 1 (1st part).

velop—something that would open the way to a final settlement of the great questions at issue.

In September, 1898, I received instructions from the Secretary of the Smithsonian Institution to visit California for the purpose of making collections and of prosecuting anthropological investigations along such lines as might promise to be of value to the National Museum. It was arranged that the work should be conducted under the auspices of the Director of the Bureau of American Ethnology. A short time before setting out I learned that Prof. W J McGee was contemplating a trip to the southwest a little later in the season, and I succeeded in inducing him to join me for a short time in the Auriferous gravel region; I thus had the advantage of conjoint work with him in a section of superlative interest geologically, archeologically, and scenically, and one that has been made classic in science by Whitney and in song by Bret Harte.

HISTORY OF DISCOVERIES

The auriferous, or gold-bearing, gravels, with which we are especially concerned, are scattered over a vast area in central California, extending from the high sierra on the east down the far-reaching ridges and canyons to the lowlands of the coastal belt, and from the Yuba on the north to the Merced on the south, an area equal in extent, perhaps, to that of the state of Connecticut.

The great gold discoveries began with the influx of miners in 1849, and during the two or three succeeding decades the gravel deposits were dug over to an extent without parallel in the history of mining operations. They were first attacked by pick and pan, then sluicing was introduced, and later hydraulic operations were conducted on a grand scale. Tunnel mining was also extensively carried on, and the mountains were pierced by countless shafts, sometimes so close together and so profound that it seemed almost that the mountains might collapse. This work had not continued long when reports began to be circulated,

gradually reaching the ears of the outer world, that relics of man were found in these gravels, and controversies arose in which the religious press took a lively part, combating the idea that traces of man could be found in formations that antedated the days of Adam, as these gravels evidently did. Mr C. D. Voy of Oakland, Dr Perez Snell of Sonora, and others collected various relics reported to have come from the gravels, and secured some data relating to their origin; but the matter was never brought to a focus until Professor Whitney became interested in the discoveries and in the early sixties began with his assistants to visit the district and to collect and collate the scattered but remarkable observations.

WHITNEY'S RESEARCHES AND CONCLUSIONS

Professor Whitney found that the gold-bearing gravel deposits were, in the main, very old; that their formation began at least in middle Tertiary time and continued down to the end of the Pliocene period, and in fact in varying degree down to the present time. Examining the evidence with the utmost care, he found it impossible to avoid the conclusion that many of the relics of man and his arts came from those portions of the gravels that could with reasonable certainty be assigned to the Pliocene; that these finds were associated with the remains of extinct species of animals and plants; that they represented a race of ordinary physical characters, though having a culture of the lowest range compatible with the human status. He pointed out that a prominent feature of the evidence was its coherency; coming from a multitude of independent sources and from widely distributed localities it all pointed in one direction. There was no suggestion of the manufacture of evidence and no apparent motive for deception. The observations were all those of miners, but a "long chain of circumstantial evidence is frequently more convincing than a single statement of an [expert] eye witness."¹ Since

¹ *Auriferous Gravels*, p. 260.

Whitney's time the evidence has been strengthened by Becker, and especially by his statement that Mr Clarence King, Director of the Survey of the Fortieth Parallel, found a pestle in the tuffaceous deposits under the lava cap of Tuolumne table mountain and removed it from the matrix with his own hands.

It is impossible not to be deeply impressed by the amount and consistent nature of the evidence presented; yet such is the magnitude of the proposition to be sustained that even this testimony seems inadequate, and we seek by reëxamination and renewed research to determine its exact strength and true significance.

AGE OF THE AURIFEROUS GRAVELS

The substantial correctness of the geologic determinations of Whitney has recently been made fully apparent by the able geologists of the U. S. Geological Survey. It was expected by many students of the subject that the relic-bearing gravels would in time prove to be younger than Whitney believed; that they would be found to correspond in age with the Glacial period—possibly with the closing episodes of that period as determined in the eastern states; and others were confident that they would prove to be even post-Glacial; but instead of this, Becker, Lindgren, Turner, and Diller have extended the gravel-forming epoch to cover the Miocene and probably the greater part of the Eocene, thus making comparisons with the close of the Glacial period hardly more reasonable than the attempt to include the whole group of phenomena within the period of biblical record. To say that they were ten times or a hundred times older than the Glacial period, as represented by the greatest extension of the ice in Ohio and Delaware valleys, would probably not be doing justice to a lapse of time that can be expressed only in several geologic periods.

As many readers may not be familiar with the geologic relations of the Auriferous gravels, and hence find themselves unable



1—Section showing conditions in early Tertiary time. *A*, Auriferous slates; *a*, *b*, stream beds.



2—Conditions at close of great gravel-forming period and before volcanic activity began. *A*, Auriferous slates; *a*, *b*, river beds clogged with auriferous gravel.



3—Conditions at close of volcanic period; valleys filled up and mountains buried with eruptive formations. *A*, Auriferous slates; *a*, *b*, *c*, river channels.



4—Conditions today. Rivers in channels 2000 feet deep. Remnants of volcanic deposits and old river gravels capping mountain summits, *c*, *e*. Old profiles shown by dotted lines.

TRANSVERSE SECTIONS OF RIVER CHANNELS, AURIFEROUS GRAVEL REGION, AT FOUR WIDELY SEPARATED PERIODS

to form definite notions of the great lapse of time and the vast transformations of nature with which we have to deal, it may be well to present briefly the main features of the later geologic history of the region. The accompanying sections, with appended data, will serve to tell the story so fully that a few words only will be necessary to make it fully understood. In early Tertiary times the prototypes of the modern rivers ran out from the sierra down through the highland to the sea pretty much as they do today. The valleys were not so deep as now, as indicated in 1, plate v, but they had strong currents and rapidly scored down the gold-bearing formations which they traversed, filling the channels with coarse, waterworn debris to the depth of hundreds of feet and depositing the freed gold along their beds. This phase of progress is indicated in 2, plate v. It is from these gravels that some of the finds of human relics are reported, and it is therefore affirmed that along the banks of these ancient rivers the first human beings of which we have a trace lived and pursued their varied avocations.

But there came over this region a momentous change. A period of great volcanic activity set in, and streams of lava and rivers of mud descended from the sierra, filling up the valleys; new channels were eroded to be filled in their turn, one system of drainage succeeding another for a prolonged period, at the close of which the deepest valleys were filled to the brim, as shown in 3, plate v; and when the flows of basalt—the final products of vulcanism—ceased, the waters of the high sierra began the work of laying out the drainage system that has come down to the present time.

Since that remote day the region has been elevated to greater heights; the Merced, the Stanislaus, the Tuolumne, the American, the Yuba, and other streams have cut their channels by the slow processes of erosion down to profound depths and now run their courses in valleys two thousand feet deep and many miles in width—gorges so profound, precipitous, and vast that it is a

day's journey to cross them even where the hand of the enterprising gold hunter has ventured to blaze the tedious way. The striking character of the present profile is shown in 4, plate V, by reference to which it may be seen that the cutting of the present valleys to such great depths has left the old stream-beds with their deposits of gravel, their treasures of gold, and (it is alleged) their relics of humanity high up toward the mountain summits (*x*). Here the miners seek and find the gravel outcrops and follow them far into and even through the ridges, the meanderings being so clearly defined that the courses of many of the Tertiary streams have been traced and laid down on the maps and the old river systems practically restored.

Those who get little idea of the lapse of time not expressed in years must fail to comprehend what vast ages are suggested to the geologist by the terms Eocene, Miocene, Pliocene, Pleistocene, and Recent, but the magnitude of the events involved—the entire obliteration of the old topography and the carving out of a new California, including such gorges as the Yosemite and the still more sublime Hetch-Hetchy—will readily be appreciated, and must make a deep impression on every mind and lead to hesitation in accepting the propositions that man matured before these events were initiated and that he has witnessed and survived their consummation.

CATEGORIES OF GRAVEL FINDS

Having reached satisfactory and apparently final conclusions respecting the age of the Auriferous gravels themselves, it is in order to examine the various groups of associated phenomena with which archeologists must concern themselves. There are four categories of data to be considered:

- A. The animal remains (lower orders),
- B. The plant remains,
- C. The remains of man,
- D. The remains of human handiwork.

A. The animal remains found in the gravels in fossil state represent a large number of species, chiefly mammals, identified by Dr Joseph Leidy. Whitney enumerates the following forms: Mastodon, elephant, rhinoceros, horse, camel, tapir, ox, llama, deer, wolf, and dog. These are all of extinct species, and although some may have existed down to post-Pliocene time, as indicated by Dr Becker, they fall as a group naturally within the Neocene age.

B. The fossil plants of the gravels secured in Whitney's time were studied by Dr Leo Lesquereux, and by this eminent authority were called Pliocene, although he found many forms that could with equal justice be assigned to the Miocene. Extensive collections obtained in more recent years have been identified by Ward and Knowlton, and it is agreed that on the whole they represent early rather than late Neocene forms, that they are clearly of middle Tertiary age. According to Professor Knowlton there is not one species which can undoubtedly be identified with living forms.¹

C. Human remains reported from the gravels are not plentiful, and all that appear to have been preserved are an imperfect human cranium known as the *Calaveras skull* and a few unimportant fragments of another skull. Fragments of skulls and various bones of the body have been reported from the old gravels in a number of localities. These remains, and especially the Calaveras skull, indicate a man not differing materially from the California Indian of today, although said by Whitney to present some characteristics of the Eskimo.

D. The remains of human handiwork to be considered are, on the other hand, quite numerous. Many hundreds of specimens have been reported from the gravels and are believed, in a general way, to belong to the Neocene deposits. According to the finders, many of them were intimately associated with the

¹ Lindgren and Knowlton, *Age of the Auriferous Gravels* (*Journal of Geology*, vol. IV, No. 3, p. 905).

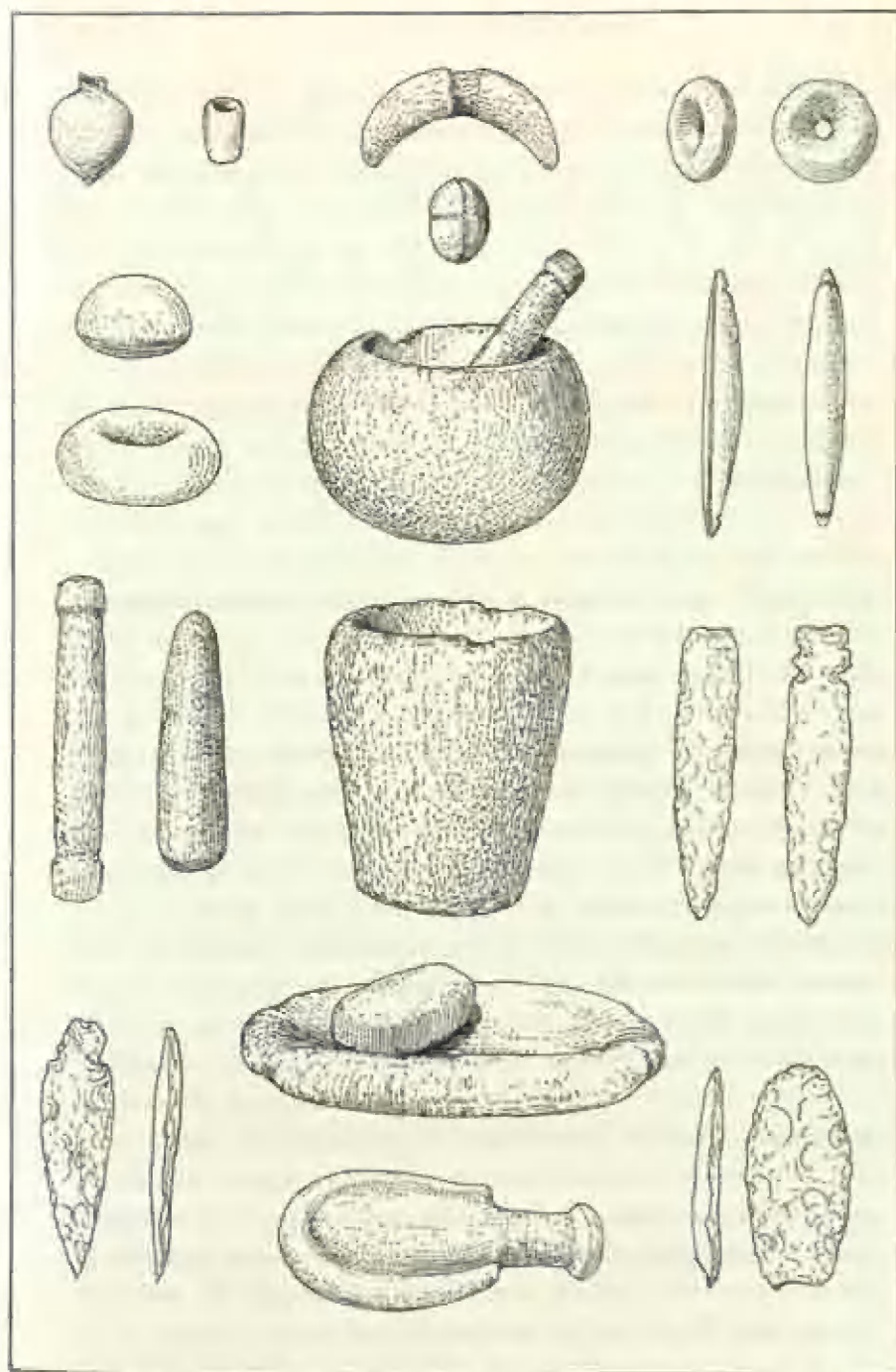
remains of fossil animals and plants, and some appear to be from gravels that antedate the volcanic era.

INCONGRUITIES IN THE EVIDENCE

In comparing these four groups of remains we observe that the fossil animals belong without exception to extinct species, that the plants are likewise extinct, and that all of both groups take their place naturally within the limits of the Neocene. When, however, we examine the human remains, we are met by the striking fact that they do not represent an extinct form, or even a well-marked variety of *Homo sapiens*, but a people structurally identical with ourselves; and it therefore takes a great stretch of the imagination to conceive that this man could have formed part of a fauna every other mammalian member of which has succumbed during the uncounted ages of succeeding geologic periods.

On examining the art remains it is found that they also seem out of place in Tertiary times, that they present a decidedly modern aspect. Of the fifteen or twenty varieties reported from the gravels by Whitney and others, all are of recent types—are identical with the stone implements used by the native tribes of California today or in the recent past. If these forms are really of Tertiary origin, we have here one of the greatest marvels yet encountered by science; and perhaps if Professor Whitney had fully appreciated the story of human evolution as it is understood today, he would have hesitated to announce the conclusions formulated, notwithstanding the imposing array of testimony with which he was confronted. To suppose that man could have remained unchanged physically; to suppose that he could have remained unchanged mentally, socially, industrially, and esthetically for a million years, roughly speaking, (and all of this is implied by the evidence furnished,) is to suppose a miracle.

Professor Whitney believed the implements found were just



IMPLEMENTS AND UTENSILS SAID TO HAVE BEEN DERIVED FROM THE AURIFEROUS GRAVELS

The figures included in the plate are copied from hasty sketches and do not assume to be exact. They serve, however, to indicate the general character of the finds. It is expected that photographic reproductions of the objects will be given in a final paper.

such as might be expected of a Tertiary man, and observed: "It has been always the same kind of implements which have been exhibited to us, namely: the coarsest and least finished which one would suppose could be made and still be implements."¹ But on examination we find that they are really of advanced types, and comprise the following varieties: Mortars (several forms), pestles (numerous forms), platters (dishes, metates), mullers (rubbing stones), hammerstones, handled ladles ("scoops"), plummet stones, rings of stone ("doughnuts"), pitted disks, shuttle-shape stones, grooved pebbles (hammerheads, sinkers), crescent stones, spearheads, arrowheads, knives, and broad blades, to which may be added stone beads and wampum.

The series of sketches presented in plate VI will convey a definite idea of the character of some of these objects and make apparent their practical identity with the familiar relics of our California tribes. The assertion that man shaped and used this group of artifacts in Tertiary times and continued to use them without change, without improvement or retrogression, down through the ages, through complete transformations of land and sea, and the extinction of all known living things, should be supported by proof more conclusive than anything yet adduced.

To suppose again that the ancient people disappeared as a result of nature's mutations, leaving their bones and handiwork in the stream beds of the Neocene period, and that another people, springing up or appearing on the same spot in recent years, have duplicated each and every character, activity, and art form, is to suppose the impossible.

Another consideration is interesting in this connection. Should we feel compelled to concede the existence of a race of advanced stone-age culture, such as that suggested by the group of artifacts presented, it would necessitate the further concession that the origin of the race was to be looked for in a still earlier period, for the best experience of anthropologists goes to

¹ *Auriferous Gravels*, p. 279.

show that early steps in culture are hesitating and slow, that the various steps which, in the normal order of culture progress, precede the era of polished stone, must have been of very great length; and should we adopt the conclusion of Whitney that no considerable advance in culture took place in California between Tertiary times and the present, and take this as a reasonable index of the rate of progress, we should have to look for the cradle of the race somewhere in the remote ages of the Mesozoic.

It may further be noted that the biologist, accustomed to regard animate nature from the point of view of the theory of evolution, will find it difficult to accept conclusions that would place the perfected man, the highest type of the highest order of animal life, the mammalia, too near the beginning of a series that ought in the natural order of things to show definite indications of progressive change.

EXAMINATION OF THE IMPLEMENTS PRESERVED

Turning now to the objects of art described by Whitney and others and preserved in the museum of the University of California and elsewhere (plate VI), we inquire more fully into their character and appearance. Whitney has said that the gravels were deposited by streams having violent currents, that the bones of animals were torn asunder and scattered, and that all objects were necessarily more or less worn; but it is observed that not one of the art objects attributed to the gravels shows the least sign of rough usage or wear; the marks they display of the tools used in flaking, pecking, grinding, and polishing are as fresh as in the implements and utensils found on modern Indian sites. This fact is so significant that it cannot be passed over without consideration.

Glancing again at the numerous implements, utensils, and ornaments attributed to the Auriferous gravels, we may inquire, What materials are represented? There are several varieties of stone, including granite, andesite, rhyolite, slate, obsidian, etc.

Andesite, however, prevails, and at least three-fourths of the objects are of this material. As most of these rocks in their original distribution are confined to somewhat limited portions of the geological column, some early and others late, it is proposed to inquire whether any of the specimens are of materials later in origin than the strata in which they are said to have been found. Full data are not yet at hand for a satisfactory analysis of this point; but it may be mentioned that andesite specimens are reported from horizons extending all the way from the earliest to the most recent gravels, yet so far as our geologists have gone this rock is not found in the formations of the particular region until toward the close of the Neocene. The objects being generally large, it is not to be supposed for a moment that they could have been brought from a distance. Again, obsidian is, generally speaking, a late product, having its origin in the most recent flows of the sierra, yet we have obsidian implements reported from the gravels of various districts, and in one case, at least, from deposits that must belong very near the initial stages of eruptive activity. This interesting line of research remains to be followed up until definite results are reached; this, however, cannot be done until the geology of the region is more exhaustively studied.

OBVIOUS SOURCES OF ERROR

It was not expected that a short visit to the Auriferous gravel region would lead to a final settlement of the whole question of Auriferous gravel man, for the task is a most difficult one. The recorded observations on which the structure of a Tertiary man is built cannot be made over again or satisfactorily tested, and new observations of a crucial nature must necessarily be of very rare occurrence. However, a reasonably intimate knowledge of the region and its phenomena was gained, and a foundation was laid for future research and for intelligent judgment as to the value of the extensive body of testimony already on record.

On reaching the mining region attention was turned first toward the nature, age, and relations of the gravel deposits, to the topographic character of the district, and to the profound changes brought about by the mining operations. Thanks to the thorough work done by our geologists, all of these matters were readily mastered, and nothing need be added to what has been said respecting them in preceding paragraphs.

In the second place, a study of the implements and utensils, ancient and modern, of the general region was made in order that comparisons might be instituted between them and the gravel finds. The results of this comparison have already been referred to, but further mention of the topic will later be made.

A third line of investigation related to the distribution of the aboriginal tribes and their relation to the mining areas and mines, and in this direction very significant observations were made. Indian village sites are scattered over the hills and tablelands, and ancient Indian sites were found everywhere. At Nevada City, Nevada county, a "Digger" Indian village was encountered on the margin of the tableland overlooking the great gravel mines a mile west of the city. Its people were engaged in gathering acorns and grinding them in mortars of various shapes; some of the mortars were worn in outcropping masses of granite, or in large, loose boulders, while others consisted of flattish or globular masses of stone more or less modified in shape by artificial means; and it was realized that, as the hydraulic work progressed in the mine below, this site would be undermined and that one by one the utensils would drop in and become intermingled with the crumbling gravels, possibly to be recovered later with every appearance of having been imbedded with these deposits when they were laid down unnumbered centuries before. One of the mortars reported by Whitney was obtained from a mine on the western slope of this same hill, and it is easy to see how it could have rolled in from an Indian camp-site above, either before or during the prosecution of mining operations. The conditions observed



1—Weathered gravel wall 200 feet in height, with ancient village site above



2—Margin of mine with ancient village site in the distance

VIEWS IN DARDANELLES MINE SHOWING POSITION OF ANCIENT VILLAGE SITE

here were repeated at nearly every mine visited in Nevada, Placer, Eldorado, and Calaveras counties. At Forest Hill, Placer county, the Dardanelles mine, extensively worked in the early days by Richard Clark and others, has undermined and obliterated a half or more of a terraced spur or "flat," as such features are called in that country, formerly occupied by an Indian village. (See plate VII.) According to Mr Clark, who still resides in Forest

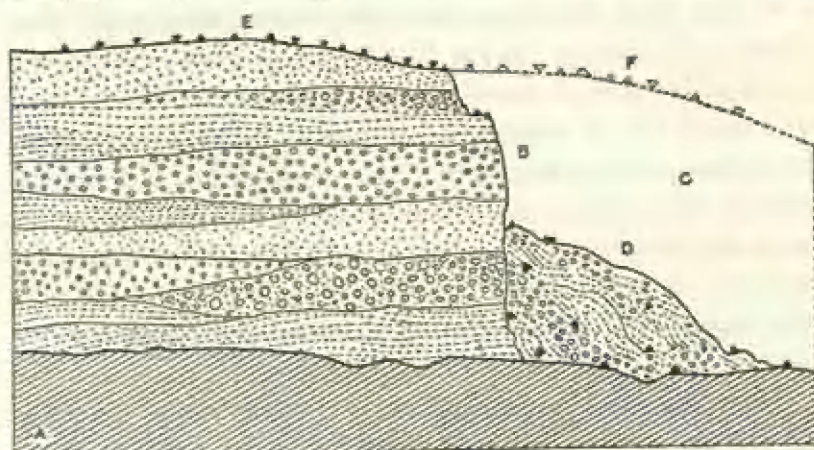


Fig. 2.—Section Showing Relations of Ancient Village Site to Gravel Mine.

A, Auriferous slates—bed-rock; *B*, Auriferous gravels, 250 feet thick; *C*, Great excavation made in gravels by hydraulic mining; *D*, Crumbled gravels, result of caving in; *E*, Ancient village site; *F*, Portion of village site destroyed by mine. The dark triangular figures in this column show the distribution of artifacts resulting from mining operations.

Hill, this site has not been occupied by the natives since work began in the mine in 1852; but an hour's search brought to light a dozen mortars and grinding stones, twenty or thirty rubbing stones and pestles, together with several varieties of smaller tools. As the ground of the site sloped toward the mine, most of the larger, and especially the rounder objects, must long since have rolled into the great pit (figure 2), the gravel walls of which are, on the one side, upward of two hundred feet in height. Many of the objects obtained were already in the gullies leading into the mine, and each year numbers must have gone over to become intermingled with the gravels, where they would remain for good unless

some observant miner happened to bring them to light. Specimens thus found, falling into the hands of such collectors as C. D. Voy, would naturally be added to the growing list of Tertiary gravel relics. The flat dish or platter found by Voy in this or a neighboring mine¹ is identical in type with several of the specimens from the village site on the brink of the mine. A rough, roundish mortar and a small handstone were found by Professor McGee on a ledge thirty feet below the brink of this mine where they had fallen from above; and at Todd's valley, a few miles farther southward, a roundish boulder some three feet in diameter, having a neatly shaped mortar in one side of it, was found resting on the bed-rock of a deep mine. This specimen had undoubtedly fallen in from above. An Indian dwelling was situated on the rim of the mine near by, and about it were scattered mortars of all kinds. A brush shelter in which the women grind acorns, a little higher up than the dwelling, contained at least a dozen pestles, both flattish and cylindrical in shape.

These significant relationships of Indian village sites and gravel diggings were repeated everywhere, and although Whitney observed the presence of the "Diggers," he made the mistake of supposing they used only fixed mortars, that is, those worked in the surface of large masses or outcrops of rock. The fact is that portable mortars and grinding stones of diversified forms are and have been used by Indians in all parts of California. It is not to be supposed that miners would pay much attention to the origin of relics found by them in the mines, since they attached no particular significance to them; so that between the unwary geologist, the unthinking miner, and the professional collector cultivating a prolific field, it is to be expected that a good many mistakes would be made.

No one can venture to say just what percentage of the finds reported by Whitney and accepted by him as evidence of antiquity are of the class here described, but certainly a large pro-

¹ *Auriferous Gravels*, p. 277.

portion may be assumed; and the observations made above cast a shadow of doubt over all specimens corresponding to known Indian forms reported from open mines, from such shafts and tunnels as do not extend beneath undisturbed formations, or from positions where any kind of post-Tertiary disturbance could have taken place.

In a second paper I hope to review the evidence further, and especially to present some data relating to the Calaveras skull.

PROFESSOR BLUMENTRITT'S STUDIES OF THE PHILIPPINES

By DANIEL G. BRINTON

Now that the Philippine islands are definitely ours, for a time at least, it behooves us to give them that scientific investigation which alone can afford a true guide to their proper management. Here, as everywhere, man is the most important factor in the problem of government, and a thorough acquaintance with the diverse inhabitants of the archipelago should be sought by everyone interested in its development.

At present, I wish to direct attention to the articles on the Philippines of an author who stands easily first among scientific writers upon them, and who has devoted his life to investigations concerning them—I mean Prof. Ferdinand Blumentritt.

This is the more seasonable, as very few readers are aware of the multitude of his articles, composed as they are in several languages and issued in publications widely asunder in time and place; and yet it is indispensable for everyone desirous of learning the ethnology of the Philippines to consult many of them. I have a number of these writings in my possession, besides the titles of others, making 146 in all, published since 1880.

It would be impossible to do justice to this mass of literature in the space at my disposal. I shall therefore mention only the most valuable to the anthropologist, arranging them in the same order in which I reviewed the ethnography of the Philippines in the *American Anthropologist* for October, 1898.

General Works.—The most extended survey of the subject is his "Ethnography of the Philippines," printed as a supplement to *Petermann's Mittheilungen* in 1882. But this, in a measure,

has been supplanted by his "Alphabetic List of the Native Tribes of the Philippines," published in the Berlin *Zeitschrift für Erdkunde*, 1890, with an important supplement in the same journal for 1893. The study of this list is indispensable to everyone who would acquaint himself with Philippine ethnography, and it ought to be translated and republished by our government. Under the title *Las Ranas del Archipiélago Filipino*, an early rescript of it, with a map, was printed in the *Boletín* of the Geographical Society of Madrid, in 1890.

Of articles of general ethnologic interest I may mention one on the census of the individual tribes (*Bijdragen tot de Taal-, Land- en Volkenkunde*, etc., 1890); on the ancestor worship and religious opinions of the Malayan tribes (*Mittheilungen* of the Geographical Society of Vienna, 1882); on the proper names of the natives and their significance in a religious sense (*Zeitschrift für die Kunde des Morgenlandes*, 1894); and on the governments of the native village communities (*Globus*, 1881).

The Negritos.—Concerning these aborigines, who are ethnographically most interesting, Professor Blumentritt's articles furnish much information. Their language is discussed from missionary sources (*Bijdragen*, etc., 1896); those dwelling in Limay are described (*Ausland*, 1883), and those of Baler (*Mittheilungen* of the Geographical Society of Vienna, 1884); their condition at the period of the conquest is set forth from the most authentic records (*Deutsche Rundschau*, 1884); recent observations upon them are summarized (Berlin *Zeitschrift für Erdkunde*, 1892); those of the province of Pampanga, Luzon, are described (*Globus*, 1882, and *Mittheilungen* of the Geographical Society of Vienna, 1893); those farther north are enumerated (*Globus*, 1884); a general article on them appeared later (*Globus*, 1885), and various brief notices occur in other numbers of the same journal.

Wild Tribes of Northern Luzon.—The name "Igorrotes" is applied by Spanish writers in a vague way to many wild tribes.

Professor Blumentritt has endeavored to assign it a definite ethnographic meaning, which, it is to be hoped, American writers will adopt (*Ausland*, 1882, and in the "Alphabetic List," already mentioned). Special studies are given on the Calingas (*Ausland*, 1891); the Ilocanes (*ibid.*, 1885); the Tinguianes (*Mittheilungen* of the Vienna Geographical Society, 1887); the Ilongotes (*Globus*, 1886, and *ibid.*, 1893); the Zambals (*ibid.*, 1886); and the Gaddanes and Ibilaos (*Mittheilungen* of the Anthropological Society of Vienna, 1884).

The Tagals and Bicol.—The ancient customs of the Tagals, from the manuscript of Juan de Placencia, are narrated by Professor Blumentritt (*Zeitschrift für Ethnologie*, 1893), and their creation myths also are related (*Globus*, 1893). Interesting facts about the Bicol, from Father Castaño, are added (*Mittheilungen* of the Vienna Geographical Society, 1896).

The Bisayas.—Under this vague term we may include the natives of Mindanao and the central islands. Those of Mindanao have been studied by Professor Blumentritt in various articles (*Mittheilungen* of the Vienna Geographical Society, 1886; *ibid.*, 1891; *Petermann's Mittheilungen*, 1891; *Globus*, vol. 71; *Ausland*, 1890; *Zeitschrift für Erdkunde*, 1896). To the natives of Palawan, several articles have been devoted (*Deutsche Rundschau*, 1884; *Globus*, 1891). The Manguianes of Mindoro, so vividly described by Professor Worcester, are depicted in an earlier notice (*Globus*, 1886, and also vol. 69); as are also the mountain-dwellers of the island Negros (*Mittheilungen* of the Vienna Geographical Society, 1890), and the natives of the Marine islands (*Globus*, 1884).

The Moros.—The Sulu islands and their Mohammedan inhabitants are the subjects of papers by Professor Blumentritt in the *Boletín* of the Geographical Society of Madrid, 1891, and in *Globus*, 1880, 1881, 1882. They should be the more carefully considered, as these piratical fanatics offer the most serious problem in the pacification of the islands.

This list gives but an inadequate account of this author's pro-

found studies of the Philippines and their conditions. He has published also numerous contributions on the dialectic Spanish there in use; on their industrial products and commercial relations; on the deposits of coal and gold; on the immigration and labor questions; on the volcanic systems; on the missions and their influence; on the causes of the revolution; on the native dialects; and on general political questions.

As no one is better informed than Professor Blumentritt on the actual mental status of the Filipinos, it will interest readers to learn that he is positive they are sufficiently advanced to be capable of independent self-government, and it is his ardent wish that this shall be the outcome of our wresting them from Spanish misrule.

THE INDIAN CONGRESS AT OMAHA

By JAMES MOONEY

Interest in the science of anthropology has grown steadily and rapidly in the last twenty years. The work done prior to that time by various scientific bodies and specialists, although good so far as it went, was yet desultory in execution and appealed only to a small circle of scholars, while it remained all unknown to the great body of educated people. The establishment of the Bureau of Ethnology in 1879 marked an era in the history of the science. Its *Annual Reports*, its *Contributions* and *Bulletins*, prepared by recognized experts and brought out usually in a high style of the bookmaker's art, have been distributed by tens of thousands to libraries, scientific bodies, and people of liberal intelligence all over the country—and in fact all over the world—until today there is not in the United States a community of any importance where these volumes are not known by the sort of people who make public opinion.

Largely through this influence local research has been encouraged and organized society effort stimulated, chairs of anthropology have been established in our leading universities, ethnologic expeditions have been fitted out at private cost, and an intelligent public interest has been awakened which finds its reflex in congressional legislation. In 1879 Congress appropriated \$20,000 for ethnologic research. In 1899 it appropriates \$50,000 for the same purpose, and if, as now seems possible, we should be called on to make color studies in the tropics, we may yet live to see the sum reach the \$100,000 mark. Last year also, for the first time, the management of a great exposition asked and obtained a special appropriation for ethnology.

The Trans-Mississippi and International Exposition held at Omaha from June to October, inclusive, in 1898, was the most successful ever held in this country, from the Centennial down, not even excepting the World's Fair. Conceived in a period of widespread business depression and carried through in the face of a foreign war, it closed with a record of over two and a half million paid admissions and a balance of several hundred thousand dollars in the treasury. Such a showing, in a town whose citizens only thirty years ago were called upon to barricade their homes against an attack of hostile Indians, well illustrates the rapid growth and tremendous energy of the west, and the grit and determination of the exposition managers, foremost among whom was Edward Rosewater, proprietor of the *Omaha Bee*. The successful outcome was due chiefly to his tireless activity and unfaltering courage. The ethnologic project was the child of his brain, and in spite of serious imperfections, the general result was such—particularly from the practical standpoint of the ticket seller—that we may expect to see ethnology a principal feature at future expositions so long as our aboriginal material holds out. Indeed, the projectors of one or two contemplated expositions, after looking over the ground at Omaha, have already included an Indian exhibit on a large scale as a part of their plans.

While in Omaha in October, 1897, the author drew up, at the request of the management, an elaborate plan of ethnologic presentation at the exhibition, based on a plan already submitted some years before to the late Professor Goode for possible use in connection with the Columbian National Park. Briefly summarized, the scheme was based, not on linguistic or tribal affiliations, but on modes of life as determined by surroundings. However, congressional delays and unexpected governmental expenditures, consequent upon the breaking out of war with Spain, prevented the carrying out of any systematic project.

On the convening of Congress in December, the friends of the exposition introduced a bill appropriating \$100,000 for an

ethnologic exhibit. It reached the conference stage with prospects bright for its passage, but before it could come to final action the war preparations monopolized legislative attention, with a consequent scaling down of appropriations all along the line. It was found impossible to effect the passage of the bill as contemplated, and it was finally incorporated as a paragraph, but appropriating only \$40,000 instead of the sum first named, in the Indian appropriation bill, which became a law on the last day of June, a full month after the opening of the exposition. The work was thus taken out of the control of the management, while no time was left for adequate preparation.

In anticipation of the passage of the bill the Indian Office had sent out to the various Indian agents an explanatory circular, setting forth the purpose of the appropriation. We quote as follows:

"It is the purpose of the proposed encampment or congress to make an extensive exhibit illustrative of the mode of life, native industries, and ethnic traits of as many aboriginal American tribes as possible. To that end it is proposed to bring together selected families or groups from all the principal tribes, and camp them in tepees, wigwams, hogans, etc., on the exposition grounds, and there permit them to conduct their domestic affairs as they do at home, and make and sell their wares for their own profit.

"It is desired that the encampment should be as thoroughly aboriginal in every respect as practicable, and that the primitive traits and characteristics of the several tribes should be distinctly set forth. This point should be constantly kept in view in the selection of the Indians and in the collection of materials. They should bring their native dress, if possible. They should also bring their native domiciles or the materials with which to make them. They should also bring the necessary articles with which to furnish and decorate their tepees or other domiciles. As this will be a most interesting part of the exhibit, the furnishings should be as attractive and complete as possible. The necessary materials for carrying on their native arts should also be brought, so that they may engage in making articles for sale on the grounds. Where this cannot be done they may bring things illustrative of their craft in reasonable quantities for sale."

Unfortunately the execution of the project was intrusted to an official unacquainted with tribal characteristics, arts, or ceremonies. As a result, no one of the leading native industries was represented—blanket weaving, pottery making, silver working, basket making, bread making, or skin dressing. Not even the characteristic earth lodge of the Omaha Indians was shown, although such houses are still in occupancy on the reservation less than sixty miles distant. The ethnologic results obtained were the work of an expert detailed at the special request of the management and were paid for outside of the appropriation.

The first Indians arrived in August, when the exposition was already half over, and they continued to come in by delegations and singly until the close. Some went home after a short time, but the majority remained to the end. The number contemplated in the estimates was 500, the actual number present varying from about 400 to about 550. Filtered water for drinking was supplied to the camp, and daily rations were issued nearly equivalent to the regular army ration. There were three deaths—a Sauk warrior, who was buried in full Indian dress, and two babies. Two infants were born during the encampment.

Omitting several delegations which remained but a short while, there were represented about twenty tribes, viz.: Apache, Arapaho (southern), Assiniboin, Blackfoot, Cheyenne (southern), Crow, Flathead, Iowa, Kiowa, Omaha, Oto, Ponka, Potawatomi, Pueblo (of Santa Clara), Sauk and Fox, Sioux, Tonkawa, Wichita, and Winnebago. The Apache were in two delegations, the Chiricahua now held as prisoners at Fort Sill, Oklahoma, and the San Carlos delegation, coming directly from Arizona. With the latter were several Mohave. The Flathead delegation included also some Spokane and Kalispel. The Kiowa were properly Kiowa Apache, practically a part of the Kiowa in everything but language. There were several delegations of Sioux, mainly from Rosebud and Pine Ridge agencies in South Dakota. The Wichita delegation included one or two individuals of the nearly

extinct Kichai, while with the Tonkawa, themselves on the verge of extinction, was a single woman of the broken tribe of the Lipán.

A glance at the list will show that four-fifths of the Indians thus brought together represented but a single type, the ordinary tipi tribes of the plains. The wood carvers of the Columbia, the shell workers and basket makers of Oregon and California, the Navaho weavers, the Pawnee—aboriginal owners of Nebraska,—the tribes of the gulf states, now living in Indian Territory, and the historic Iroquois of the long-house were unrepresented.

Linguistically, the tribes are classified as follows: ALGONQUIAN STOCK—Arapaho, Blackfoot, Cheyenne, Potawatomi, Sauk and Fox; ATHAPASCAN STOCK—Chiricahua Apache, San Carlos Apache, Kiowa Apache, Lipán; CADDOAN STOCK—Wichita, Kichai; SALISHAN STOCK—Flathead, Spokane, Kalispel; SIOUAN STOCK—Assiniboin, Crow, Iowa, Omaha, Oto, Ponka, Sioux, Winnebago; TANOAN STOCK—Santa Clara Pueblo; TONKAWAN STOCK—Tonkawa; YUMAN STOCK—Mohave.

We shall now speak in detail of some of the tribes, beginning with one of the most interesting. The Wichita, with their confederates, the Waco, Tawákoni, and Kichai, numbering now altogether only about 320, belong to the Caddoan stock, and reside on a reservation in southwestern Oklahoma. The first three are practically one people and speak a dialect of the Pawnee language, the Tawákoni particularly claiming close relationship with the Skidi division of the Pawnee. The Kichai, reduced now to about 60 souls, are the remnant of a tribe from eastern Texas, with a distinct language of their own. The Wichita call themselves *Ktikittish*, meaning literally, "raccoon eyelids," but understood to signify "tattooed eyelids," from a former custom among the men of tattooing lines upon the eyelids. The women tattoo lines upon the chin, and some of the older ones have their breasts covered with tattooed designs. From this custom the Wichita derived their French name of *Panis Piqués*. The common name of

the tribe has been variously explained, but may be connected with *wits*, or *wets*, their own word for "man."

Within the historic period, which in their case dates back more than three centuries, they have ranged from central Texas to Arkansas river, and there is evidence that at one time a part of them at least lived farther eastward in Arkansas and Louisiana. They are identical with the people of the ancient Quivira, with whom Coronado, in 1541, found "corn and houses of straw." At the beginning of their official relations with the government the Waco and Tawákoni were in Texas, about the present Waco city and Tawákoni creek, while the Wichita and Kichai had their permanent village in the Wichita mountains, on upper Red river. Driven out of Texas by the whites, they were collected on the present reservation in 1859, but had hardly gathered their first crop when they were again scattered by the outbreak of the civil war, and fled north, remaining about the site of the present city of Wichita, Kansas, until the struggle was over, when they returned to their homes on the reservation. They have never been at war with the whites.

Like all the tribes of Caddoan stock, the Wichita are an agricultural people, and even before the coming of the white man raised large quantities of corn, which they ground into meal upon stone metates or in wooden mortars, or boiled in pottery of their own making. Their surplus supplies were deposited in cistern-like caches lined with bark.

Their permanent houses are of unique construction, being dome-shape structures of grass thatch laid over a framework of poles, with earth banked up around the base. From Catlin we have a picture of such a village, as he found it, on upper Red river in 1834, but, as is the case in other of his drawings, with the forms somewhat idealized. It may be mentioned that the circular embankments on this village site were plainly to be seen when the writer identified the location a few years ago. In making up the Wichita delegation for Omaha a typical grass house

was bought from the owner, on the reservation, with the understanding that it should be taken down and the materials transported in Indian wagons to the railroad, thirty miles away, thence to be shipped to Omaha, to be again set up on the grounds of the Indian congress. The contract was faithfully carried out. The grass house was taken down, transported by wagon and rail, and again set up in the original materials at Omaha, the rebuilding requiring the labor of several women about one week.

The inside support was a substantial square framework of stout logs, about eight inches in diameter, planted upright in the ground, supporting cross-pieces of the same size laid in crotches at the top. Over these cross-pieces were bent long, flexible, half-round timbers, having their bases planted in the circular trench which formed the circumference of the structure, while their tapering ends were brought together at the top and bound firmly with elm bark to form the rafters. Smaller flexible poles of perhaps an inch in diameter were then bound across these at regular intervals from the ground to the top. Over this framework the long grass was laid in shingle fashion in regular rounds, beginning at the bottom, each round being held in place by light rods fastened with elm bark to the supporting framework and cleverly concealed under the next round of grass. Near the top, but at the side instead of in the center, was the smoke-hole. Doorways were left at opposite sides to allow the breeze a free sweep, and detached doors were made of grass over a frame of rods. Around the inside were high bed platforms, and in the center was the fire-hole, with a support from which to hang the pot. There was also a grass-thatched arbor built in the same fashion, with a sweat-lodge of willow rods. A curiously painted Indian drum, which they brought with them, hung up on the outside, the mortar and the metate near the doorway, and the bunches of corn and dried pumpkin, with the Indian owners themselves, made the Wichita camp altogether perhaps the most attractive feature of the congress.

At the close of the exposition the grass house, with the mortars and metates, was purchased for the National Museum, and the materials transmitted to Washington to be again set up in the Columbian Park, where future visitors may have opportunity to study the structure of the "straw houses" of old Quivira.

The Wichita delegation numbered thirty-eight, of whom fifteen lived in the grass house, while the remainder occupied several canvas tipis adjoining. The party had been carefully selected, and included several noted runners distinguished in the ceremonial foot-races of the tribe, two Kichai women, still retaining their peculiar language, and one of them with the old-style tattooing upon her face and body, and a mother with an infant in a cradle of willow rods. Physically the Wichita are dark and generally of medium size, with flowing hair inclined to waviness. They were accompanied by their chief, known to the whites as Tawákoni Jim, a man of commanding presence and fluent eloquence, and in former years a scout in the service of the government.

Another interesting southern tribe represented was that of the Kiowa Apache, now numbering about 220, on a reservation in southwestern Oklahoma, adjoining the Wichita. Although closely associated with the more numerous Kiowa, they are of Athapascan stock, coming originally from the far north. They call themselves *Nadl-ishañ-Dina*, and are mentioned under their Pawnee name of Gátaka in a French document of 1682, being then in the same general region where they became better known at a later period, participating with the Kiowa in all their raiding wars until assigned their present reservation in 1869. Until within a few years past they have been a typical plains tribe, without agriculture, pottery, or basketry, depending entirely on the buffalo for subsistence, and shifting their skin tipis from place to place as whim or necessity guided. They hunted and fought on horseback, carrying the bow, the lance, and the shield (and

more recently the rifle), and joined with the Kiowa in the great annual ceremony of the sun dance. Physically they are tall and well made, with bold, alert expression.

Every man and woman of the delegation came dressed in full buckskin, beautifully fringed and beaded. They set up their canvas tipis adjoining the Wichita, inclosing one of them with a circular windbreak of leafy willow branches after the manner of the winter camps of the plains Indians. Suspended from a tripod in front of the same tipi was a genuine, old-time "buffalo shield," the last shield remaining in the tribe. It is now the property of the National Museum.

It may be in place here to describe the tipi, the ordinary dwelling of the plains tribes. The name *tipi*, "house," is from the Sioux language and has now almost entirely superseded the former term, lodge.

The tipi is a conical structure, formerly of dressed buffalo hides, but now of cow-skins or canvas, sewn together with sinew, over a framework of poles of cedar or other suitable wood, tied together near their tops and spread out at the ground to form a circle of about twenty feet diameter. An average tipi occupied by a family of about six persons has twenty poles in the circle and stands about fifteen feet high to the crossing of the poles. Three—or with some tribes four—particularly stout poles form the main support of the structure. One of these is at one side of the doorway, which always faces the east; another, to which is usually tied the "medicine-bag" of the owner of the dwelling, is nearly opposite the doorway, while the third is on the north side. These three poles are first tied together about two feet from their upper ends with one end of a long rope, and are then raised in place by the women and firmly planted in the earth. The other poles are next sorted out according to length and leaned against them in such way that when set up the tipi's longest slope will be toward the front. The formula is: three main poles; two sets of five longer poles each, one for each side and extending

around to the doorway; two sets of three shorter poles each, for the back; one pole which is fastened to the tipi covering at the back and serves to lift it upon the framework. There are also two outside poles for the flaps. As each set of poles is put in place another turn of the rope is taken around them at the crossing, and when all are up the loose end of the rope is wound around one of the main poles and firmly tied. The covering being lifted upon the framework, the two ends are brought together in front and fastened with a row of wooden pins running upward from the door, which may be a simple hanging flap, a coyote skin, or something more elaborate. About twenty pegs fasten the edges down to the ground, grass and wild sage being used to fill in any spaces which might admit the cold air. The opening where the poles cross allows the smoke to escape. On each side of the opening is a flap, held in place by two other poles on the outside of the tipi, by means of which the draft is regulated as the wind changes.

The fire is built in a shallow hole dug in the center of the tipi. Behind and on each side of the fire are low platforms, set close against the wall of the tipi, which serve as seats by day and beds by night. The frames are of small poles, supporting mats of willow rods, usually looped up at one end in hammock fashion, and covered with skins or blankets. Above the beds are canopies set so as to catch the stray drops which come in through the smoke-hole during rainstorms. The clear space of ground immediately about the fireplace, where the women attend to their cooking operations, is sometimes separated from the bed space by a border of interwoven twigs. The tipi is painted on the outside with heraldic designs and decorated with buffalo tails, streamers from the poles, or similar adornments. In summer it is set up on the open prairie to escape the mosquitos. In winter it is removed to the shelter of the timber along the river bottom, and surrounded with a high fence or windbreak of willow branches neatly interwoven.

Such was the dwelling until recently in constant use by all the buffalo-hunting tribes from the Saskatchewan to the Rio Grande, and for a part of the year also by the semi-sedentary agricultural tribes, such as the Ree, Pawnee, and Wichita. No other structure met so well the requirements of the nomad hunters of the plains, as no other is so easily portable and so well adapted by its shape to withstand the stormy winds of a timberless region. This is shown by the fact that it has furnished the model for the Sibley tent. It is still in use by all the plains tribes, with no change from former methods of construction excepting in the substitution of canvas for buffalo hides and in the general inferiority of ornamentation and workmanship.

Of the Kiowa Apache delegation the most prominent member was the hereditary chief, White-man, now nearly seventy years of age, a kindly, dignified gentleman, who has twice represented his people at Washington. In spite of years he sits his horse as firmly and bears his lance as steadily as the youngest of his warriors. In former days he was one of the two war leaders deemed worthy to carry the beaver-skin staff which pledged them never to avoid a danger or turn aside from the enemy. Another notable man is the captive, Big-whip, whose proper name is Pablino Diaz, and who jokingly claims kinship with the distinguished president of the sister republic. He is one of a considerable number of captives still living among these southern tribes, which formerly made Mexico and the Texas frontier their foraging grounds. Unlike most of these unfortunates, Pablino retains the knowledge of his name and his Spanish language, and remembers vividly how he was taken, when about eight years of age, in a sudden dash by the Apache upon the town of Parral in Chihuahua.

With some modification of detail the description of the Kiowa Apache will fit the other plains tribes represented at the congress: the Dakota, Assiniboin, Crows, and Blackfeet of the north; the Omaha, Ponka, and Oto of the central region; and the Cheyenne and Arapaho of the south. With the exception of the

Omaha and Ponka, who are practically one people, they were all roving buffalo hunters, fighting and hunting on horseback, dwelling in skin tipis, practicing no agriculture, using the same weapons, and having similar military organizations and tribal ceremonies. Most of them seem to have been unacquainted with the clan system. The Omaha and Ponka had corn and earth-covered lodges, both of which they probably obtained originally from their allies, the Pawnee. All wore the prairie moccasin, breechcloth, and buckskin dress, differing only in length of fringe or color of decoration. They wore no head covering except for ceremonial purposes. The men wore the scalp-lock, usually having the rest of the hair braided and hanging down in front on each side of the head. With the Crows, and sometimes the Blackfeet, it was pushed up or roached over the forehead. Excepting in the substitution of cloth for buckskin, the majority of these Indians are but little changed in appearance from the time when they were first put on reservations. They are all of fine physical type, as might be expected in a race of warriors and horsemen. The build is sinewy and the features thin and clear-cut, excepting the semi-agricultural Omaha and Ponka, who show the effect of a partial grain diet in rounder faces and portlier figures. The Blackfeet and Crows are especially tall, with the Cheyenne and Arapaho not far behind. The Dakota are notable for their aquiline noses and light complexion, the Cheyenne also being much lighter in color than their neighbors.

The Sioux, who call themselves *Dakota* or *Lakota*, "allies," number about 25,000 souls, being the largest tribe or confederacy in the United States. They formerly owned the greater portion of both Dakotas, with about one-half of Minnesota, and are now gathered on reservations within their ancient territory. Although well known linguistically and in the pioneer history of the west, they have yet to be studied from the ethnologic point of view. Their language was reduced to writing some sixty years ago and has now a considerable literature. Nearly all the men of the

tribe are able to conduct personal correspondence in their own language. They have a special fondness for parade, and eagle-leather war-bonnets are particularly numerous in this delegation. Among those in attendance were several men of prominence, but no generally recognized chiefs. Their tipis, some of which are tastefully decorated, were set up in a circle, following the old custom of the plains tribes. The Watópana, "paddlers," or Assiniboin, are an offshoot from the Yankton Dakota and speak their dialect. Their range was north of that of the Dakota, extending across the Canada boundary. They now number about 1400, gathered on two reservations in Montana, besides a small number in Canada. They brought with them a fine specimen of the old-style heraldic tipi.

The Crows (*Absdrokit*), numbering now about 2100 on a reservation in Montana, occupied the Yellowstone country, west of their hereditary enemies, the Dakota. Although predatory in habit, they have never been at war with the whites, but on the contrary have usually furnished a contingent of scouts for the government service in the various Indian campaigns of that region. They have marked tribal characteristics, which would well repay study, as they are practically unknown to the ethnologist. The most prominent man of the delegation was White-swan, a former scout and the sole survivor of the Custer massacre in 1876, in which notable engagement he was shot and hacked almost to pieces and finally left for dead, but managed to save his life by covering himself with the blanket of a dead Dakota. With his hearing destroyed by blows of the tomahawk, his hands crippled by bullets, and his whole body covered with enduring scars, he is still able to tell the story in fluent sign language.

The *Si'ksika*, or Blackfeet, known to ethnologists through the researches of Grinnell, are an important tribe numbering about 6000, in various subtribes and bands, formerly ranging over the whole country from the Yellowstone to the North Saskatchewan. Nineteen hundred of them are now gathered on a reservation in

Montana, the rest being in the adjacent Canadian province. Associated with them are two smaller tribes, the Arapaho Grosventres and the Sarsi. In physique the Blackfeet are among the finest men of the plains, tall and well built, with erect pose and steady countenance. Those in attendance at the congress belonged to the Piegan division, and brought with them an old-style ornamented skin tipi.

The Omaha, Ponka, and Oto, closely related Siouan tribes, numbering, respectively, 1170, 820, and 350, originally had their settlements along Missouri river in eastern Nebraska, under the protection of the powerful Pawnee, who claimed the whole Platte region. Occupying thus a subordinate position, they have never been prominent in tribal history, although in ethnology they are among the best known tribes of the west, owing to the extended researches of Dorsey, La Flesche, and Miss Fletcher. The *Omañ'hañ*, or Omaha, have given their name to the exposition city. The word signifies "up stream," as distinguished from cognate tribes formerly living farther down the river. They are also the originators of the picturesque Omaha dance, now common to most of the plains tribes. They reside on a reservation about sixty miles northward from Omaha and within the limits of their original country. Most of them now live in frame houses, but others still prefer their oldtime earth-lodge. Some of the Ponka also are on a reservation in northeastern Nebraska, but the majority, with the Oto, have been removed to Oklahoma.

The allied Cheyenne and Arapaho, who call themselves, respectively, *Daktsi'stás* and *Ind'na-tna*, both names being about equivalent to "our people," were represented by a large delegation from Oklahoma. Typical buffalo hunters of the plains, they yet have traditions of a time when they lived in the east and planted corn. The Cheyenne number in all nearly 3500, of whom 2000 (Southern) are on a reservation—now thrown open to settlement—in western Oklahoma, the remainder (Northern) being on a reservation in Montana, excepting a few living with

the Dakota or Sioux. Their tribal "medicine" is a bundle of sacred arrows in the keeping of one of the southern bands. They are a proud, warlike people, who have left a strong impress on the history of the plains. The Arapaho, numbering in all about 1800, are also in two divisions, the larger body living with the Cheyenne in Oklahoma, while the northern division resides with the Shoshoni on a reservation in Wyoming. The Grosventres of Montana, formerly associated with the Blackfeet and numbering now about 700, are a detached band of Arapaho. Unlike their allies, the Arapaho are of accommodating temper, disposed to pattern from our civilization, while the Cheyenne are strongly conservative. Their "medicine" is the "flat pipe," in the keeping of the northern division. As yet there has been no extended study of either of these interesting tribes, although some good linguistic work has been done among the Cheyenne by the Menonite missionary, Petter. The two tribes are devoted to the ghost dance and are considered the most expert sign-talkers on the plains. (See plate VIII.)

From their reservation in western Montana came a delegation of Flatheads (*Salish*), the historic tribe of De Smet and Ravalli, accompanied by several Spokán (*St'ngomén*) and Cœur d'Aléne (*Ka'ispé*), the three tribes being closely associated and cognate, speaking nearly similar Salishan dialects and having the same dress and general appearance. Despite their name, the Flatheads do not, and never did, have flat heads. This paradoxical statement is explained by the fact that the Indians of the Columbia region, most of whom formerly compressed the head by artificial means, considered their heads thus treated as *pointed*, and contemptuously applied the term "flat-heads" to their neighbors in the mountains, who had not the custom, but allowed the skull to retain its natural shape. The early travelers adopted the name without understanding the reason of its application, and thus it came that the one tribe which despised the practice was supposed to be above all others addicted to it.



GROUP OF SOUTHERN ARAPAHO

Little-child

Hiding-woman
Bear-woman

Little-bear
White-bull

Hawk
Freckle-face

Little-bird

The men wear their hair turned up from the forehead, somewhat after the manner of the Crows. Their color is not the coppery brown of the eastern Indians, but rather the creamy yellow sometimes seen among the Pueblos, which might be described as Mongolian were not that term so liable to misconstruction. In temper they are good-natured and fond of pleasantries, here again resembling the Pueblos rather than the sterner warriors of the plains. They formerly occupied the tangle of rough mountains at the extreme head of Missouri river, subsisting more by roots and berries than by hunting, as they were cut off from the buffalo country by their powerful enemies, the Blackfeet. They had houses of bark and reeds, as well as the skin tipi. In 1841 the heroic De Smet began among them that work which continues to be the most successful in the history of our Indian missions. In 1855 they were gathered on a reservation, where the confederated tribes now number about 2000, besides about 670 Spokán and 500 Cœur d'Alène on the Colville reservation in Washington.

The *Hochá'nka-ra*, or Winnebago, formerly having their territory in southern Wisconsin about the lake that bears their name, were represented by a considerable delegation under a sub-chief, Black-hawk. They speak an archaic and strongly marked Siouan language, but had their alliances with the Algonquian tribes rather than with their own kindred to the westward. In dress and physical characteristics also they resemble the eastern Indians, wearing the turban, the beaded garter, and the short breechcloth, and having the compact heavy build of the agricultural tribes of the timber region. Living remote from the buffalo country, they subsisted principally on corn, wild rice, fish, and small game. Their houses, still in common occupancy on their reservation, are of the wigwam type, of woven rush mats upon a framework of poles, much resembling the wigwams of their former neighbors, the Sauk. Friendly, but conservative, they have a rare mass of ethnologic lore which yet remains to be studied.

They number now about 1150 on a reservation adjoining the Omaha in northeastern Nebraska.

The historic Sauk and Fox were well represented by a large delegation from Oklahoma and a smaller party from the band now living in Iowa. These two tribes, calling themselves respectively, *Sdgiwâk* and *Mûskwâkiûk*, names of somewhat doubtful interpretation, are practically one people, speaking closely related dialects of one language and having been confederated from a very early period. They were prominent in every Indian movement of the lake and upper Mississippi region from the beginning of the French and Indian war until their power was broken by the result of the Black-hawk war in 1832. Their territory lay on both sides of the Mississippi, in Iowa and northern Illinois, having the cognate Potawatomi and Kickapoo on the east, the Winnebago and Dakota on the north, and the Iowa on the west. With all of these, excepting the Dakota, they maintained a friendly alliance. Keokuk, in Iowa, derives its name from a noted friendly chief of the Black-hawk war, and Anamosa in the same state commemorates an heroic mother of the tribe who swam the Mississippi with her infant tied upon her back to escape a massacre in which nearly two hundred men, women, and children of the Sauk fell by the bullets of 1600 American troops. The younger daughter of Anamosa accompanied the delegation.

The Sauk have always been agricultural, and they wear the turban and characteristic moccasin of the eastern tribes. Their beaded work is especially beautiful, and like the Winnebago they weave fine mats of rushes with which they cover the framework and carpet the floors of their long, round-top wigwams. They brought with them sufficient of these mats to set up several wigwams, which are entirely different in shape and structure from the conical tipi of the plains tribes. In person they are tall and strongly built, with faces indicating thoughtful character and firm will. With proud conservatism they hold fast their forms, legends, and complex social organization, and are today probably the

most interesting study tribes of the whole existing Algonquian stock. They have a syllabic alphabet, apparently the work of some early French missionary, by means of which they keep up a correspondence with friends on their various scattered reservations. The same vehicle could doubtless be used in recording their songs and rituals. The two tribes now number together about 970, of whom 500 are in Oklahoma, nearly 400 in Iowa, and a small band in Kansas. Some work has recently been done by Prof. W J McGee in the Iowa band, which is composed chiefly of *Máskwaki*, or Foxes.

With the Sauk there came also several of the cognate Potawatomi (*Potewdtmík*), and four Iowa (*Páhoche*), the latter being a small Siouan tribe, now reduced to 260, formerly living, in alliance with the Sauk, in central Iowa, which derives its name from them.

The Pueblos were represented by a delegation of about twenty men from Santa Clara pueblo on the upper Rio Grande in New Mexico. As is well known, the Pueblos constitute one of our most distinct and interesting native types, but owing to the fact that the agent who made up the delegation was instructed to send only men, it was impossible to make any showing of such characteristic industries as bread making, pottery making, or basket weaving. As Santa Clara is one of the smallest of the pueblos, and only a short distance from the railroad and the town of Española, its inhabitants have been so modified by contact with white civilization that they have almost forgotten their aboriginal arts and ceremonies. Being unable to carry on any of their native industries or to participate in the ceremonials of the other tribes, the Santa Clara men confined their effort chiefly to disposing of some cheap pottery of the sort made for sale to tourists at railway stations.

The 26 existing Pueblo towns of New Mexico and Arizona, with some transplanted settlements near El Paso, Texas, have altogether a population of about 11,000 souls, representing, according to our present knowledge, four different linguistic stocks.

Three pueblos have more than one thousand souls each, while Santa Clara has but 225. The type is too well known, from the researches of trained investigators, to need any extended notice here. The Santa Clara Indians belong to the Tanoan stock. They call themselves *Owi'né*, and their village *Ka'pa*, a name which seems to contain the root *pa*, water. They are aware of their relationship to the people of the Tusayan village of Hano, which some of their old men have visited. Nearly all have Spanish names in addition to their proper Indian names. They elect a governor, or chief, every year. Their present governor, Diego Naranjo, with the last ex-governor, old José de Jesus Naranjo, accompanied the party, the former bearing as his staff of office an inscribed silver-headed cane presented to the pueblo by President Lincoln in 1863.

A small but notable delegation was that of the Tonkawa, who call themselves *T'chkan-wdtich*, "indigenous people," a title arrogated by half the insignificant little tribes known to ethnology. Although the mere remnant of a people on the verge of extinction, the Tonkawa are of peculiar interest from the fact that, so far as present knowledge goes, they constitute a distinct linguistic stock, and are the only existing cannibal tribe of the United States, while historically they are the sole representatives of the Indians of the old Alamo mission, whose most tragic incident had its parallel in the massacre that practically wiped out their tribe.

Living originally in southern Texas, the Tonkawa experienced all the vicissitudes that come to a vagrant and outcast people until they were finally gathered, in 1859, on what is now the Kiowa reservation, having their village on the south bank of the Washita, just above the present Anadarko. The other tribes, which hated them for their cannibal habit and for the assistance which they had given the troops in various border campaigns, took advantage of the confusion resulting from the outbreak of the rebellion to settle old scores, and joining forces against the Tonkawa,

surprised their camp by a night attack on October 23, 1862, and massacred nearly half the tribe. Since then their decline has been rapid, until there are now but 53 left alive, on lands allotted to them in eastern Oklahoma. Some excellent studies have been made among them by Gatschet, who determined their linguistic isolation. Their chief, Sentele, alias Grant Richards, a former government scout, accompanied the party.

The celebrated tribe of Apache, who call themselves *Ndt*, "men," was represented by two delegations, numbering together about forty persons, viz: some White Mountain Apache from San Carlos reservation in Arizona, and some Chiricahua from Fort Sill, Oklahoma, where they are now held under military restraint. With the former there were also some Mohave, a distinct tribe of Yuman stock.

From their connection with the border wars of the southwest, and through the researches of the late Captain Bourke, the Apache are so well known as to require no extended notice here. A part of the great Athapascan stock, they have fought their way through hostile tribes from Yukon river to the Rio Grande, finally establishing themselves in the mountain region of southern Arizona and New Mexico, whence they made unceasing forays in all directions until their name became the synonym of all that was savage and untamable. From the nature of the country in which they lived, and their inherited capacity for enduring hardship, they proved the most dangerous foes against whom our troops were ever forced to contend. Since their final subjugation a few years ago they have tried to adapt themselves to the situation, and evince a native intelligence and solidity of character that bid fair to place them in the front rank of self-supporting tribes. It will be remembered that they are first cousins of the Navaho, the most successful stock raisers and most expert weavers in the United States. They number nearly 5000, all now on San Carlos reservation in Arizona, excepting the Chiricahua band of about 300, held as prisoners of war at Fort Sill. They have no central

organization, but are subdivided into a number of bands, each under its own chief.

The White Mountain delegation was under command of the hereditary chief, Go-zhazh, "Jingling," known to the whites as Josh, of pleasing features and manly air (plate IX). They wore the dress of their tribe, with flowing hair, red turban, close-fitting buckskin legging, and characteristic turned-up moccasin. The women have their hair cut across the forehead. Nearly all the men had tattooed upon their foreheads figures resembling the rain and cloud symbol of the Hopi. The Mohave had the same dress and general appearance. They brought with them their native baskets and dance costumes and set up their round-top canvas wikiups after the style of those on the reservation.

The Chiricahua, the last Apache band to go on the warpath, were finally run down and compelled to surrender to General Miles in 1886. As the people of Arizona protested against allowing them to remain longer in that territory, they were deported bodily to Fort Marion, Florida, thence after some time to Mount Vernon barracks in Alabama, and at last to Fort Sill, on the Kiowa reservation, Oklahoma, where under a few years of good management they have developed from miserable savage refugees to prosperous farmers and stock raisers, quite a number being enrolled and uniformed as United States scouts. The delegation was a picked one, and included Naichi, "Meddler," the hereditary chief of the band, a man of soldierly air and figure; Geronimo, the old war captain, a natural leader of warriors, but withal a most mercenary character, with one or two foot-racers and experts in native arts, and several women, with two infants in cradles. Being under military control, they were housed in army tents. The exiles devoted their time to good advantage, making baskets, canes, and beaded work for sale, and found much pleasure in meeting their old friends from Arizona and exchanging reminiscences.

Some tribal ceremonies were arranged, but were discontinued owing to an evident purpose to reduce everything to the level of



SAN CARLOS APACHE

Jesus

Chief Josh

a "Midway" performance. Among those given were the noted ghost dance of the plains tribes, the mounted horn dance of the Wichita, and the unique and interesting war dance and devil dance of the Apache, the last being performed at night by the light of a fire, with a clown and other masked characters, after the manner of the Hopi or Moki dances. There were also foot-races by picked runners from several tribes.

The Kiowa camp circle—a series of miniature heraldic tipis in buckskin, with the central medicine lodge and all the necessary shields, tripods, and other equipments to make it complete—was brought from Washington and set up within a canvas corral of eighty feet diameter. This presentation of the old camp circle of the plains tribes is a complete reproduction, on a small scale, of the last great sun-dance camp of the Kiowa Indians, just previous to their signing of the historic treaty of Medicine Lodge in 1867, by which they gave up their free life and agreed to be assigned to a reservation. It is the property of the National Museum, and was prepared on the reservation under direction of the Bureau of American Ethnology, every miniature tipi and shield having been made by the hereditary Indian owner of the original.

Under an arrangement between the exposition management and the Bureau of American Ethnology a special fund was appropriated for securing portraits of the Indian delegates. The work was done by the exposition photographer, under the supervision of a member of the Bureau, according to a systematic plan, the Indians being photographed in costume in tribal groups and singly, in bust, profile, and full length, resulting in a series of several hundred pictures forming altogether one of the finest collections of Indian portraits in existence. The negatives are now in possession of the Bureau. At the same time the Indian name of each individual was obtained, with its interpretation, and some points of information concerning the tribe, with brief vocabularies of each language, from which is selected the following short list of words for comparison:

CADDISAN STOCK			TONKAWAN STOCK	SALISHAN STOCK
<i>Witchita</i>		<i>Kitchai</i>		
Proper tribal name	Ki'tikiti'sh	Kitua'sh	Ti'chkan-wa'tich	Se'lab
Man	wets	wi'ta'	s'ako'n	skalmi'gu
Woman	gabe'k	hakwa'k	epai'ago'tan	e'mim
One	tsi'la	li'rik	wisipduq	nko
Two	wila	tsana	kedai'	e-sh
Three	daw'	da'w'ko	mei'ah	chêles
Four	da'kwite	g'mi'ke	shet'et	mûs
Five	tskwe'la	tsedo'io'q	gankwa'	zi
Six	ge'hla	nahita'w	shi'wa'la	tsakan
Seven	go'ahwila	tsa'watit	shih'eshita'	shpel
Eight	go'ata'w'	na'higind'at	shih'it'sh	hobânem
Nine	châk'nde'	da'neroga't	shik'wheqwa'la	ganât
Ten	tsêl'rilwa'sh	ika-kyân	sekpa'q	open

SIOUAN STOCK

	<i>Dakota</i> (Green)	<i>Assiniboin</i>	<i>Ojibwa</i>	<i>Winnebago</i> (Ruggs)	<i>Crow</i> (Hayden)
Proper tribal name	Lako'ta (Dakota, Nago'ta)	Wato'pank	Wato'qata	Hochi'nka (-ra)	Aub-sa-ro-ke
Man	wichia'na	wichia'	wanpi	wang'-ra	hatsic' (watsi')
Woman	wi'nyah	willa	hina'gi	hinun'g-ra	mi'e
One	wahchi'la	wancha	yûnk	jankila	hanna't
Two	uolpa	nopa	no'fiwe	namapiwi	rop
Three	ya'mini	ya'mini	da'nyi	tani	nam
Four	topa	dopa	dow'	espi	shop
Five	zapi'e	zapa	tsûlûn	tsata	tsihog
Six	na'kopi	shakpe	sha'gwê	ake'wo	aka'nak
Seven	sako	shago'a	sha'ma'fi	shakowin	ha'pua
Eight	sa'kolo'ga	shak'-ndo'-gha	gre'n'lalet	hadunwank	no'pape
Nine	nupahi'-u'ika	napecho'ûnk	kaank'ê	hi'jank'i-conkoni	ama'lope
Ten	wikaha'mini	wikache'bua	gre'bra'	kedepanajun	pi'roka

KOREAN CLAN ORGANIZATION

By WALTER HOUGH

The following information concerning the Korean family or survival of the clan was elicited during several conversations with an intelligent Korean, Mr Kiu Beung Surh, who is receiving his education in the United States. The strength of a clan organization in an ancient country like Korea, which has long possessed a general scheme of government, is interesting.

Clan Head and Council Delegates.—The head of the clan (family) is the direct male descendant of the ancestor by primogeniture. The government of the clan is by the head (*chong son*, "direct descendant") and a council elected by groups of the family in various parts of the country. The head of each family group becomes such by nearness to the line of descent, by age, or ability.

The delegates to the clan council, which is held usually in Seoul, are elected by ballot, viva voce, or by appointment by the local head. Only one delegate is sent from each village, and his expenses are borne by the group. Others may go, however, if they defray their own expenses. In case no delegate is sent, the head imposes a fine. The head also levies a tax or assessment on the members of the clan. This tax is not uniform, but is fixed in accordance with the means of the individual. The money collected is paid to the keeper of the central clan meeting-house (*ta tchong ka*, "great family house," the word *tchong* meaning blood relationship or brother). The tax is applied by the keeper, under direction of the council, toward keeping up the ancestral tombs, shrines, and sacrifices, to investment in land, etc., and to the maintenance of such land and the clan house.

The revenues of the clan lands are also applied to meet expenses. The keeper usually farms the clan lands, and his services are therefore remunerated.

Meeting-place of the Council.—The clan house may be situated in any part of the country, but usually it is located at the capital. The care of the house devolves on the keeper, who is not necessarily a member of the clan.

Business of the Council.—Meetings are called on many matters connected with the interests of the clan, such as the death of a prominent member, congratulations on the advancement of members of the clan, questions relating to burial grounds over which disputes may arise, or for the expulsion of members from the clan, etc.

Burial Grounds.—It should be explained that the clan cemetery is located at one place, to which the remains of all deceased members are taken for interment. The tombs of the ancestors are kept in repair by the clan, each existing family unit caring for the graves of its own immediate dead. In case of the decline or extinction of a family, the clan provides for the care of the tombs. The selection of a cemetery in Korea is a complicated proceeding, and is the result of a great deal of research by an "earth doctor," who chooses a place free from evil influences (*feng shui* of the Chinese) by means of geomancy. This earth doctor is an important personage, as he is supposed to be familiar with the place-spirits and earth-spirits, which among primitive peoples are believed to vivify inanimate matter. The graveyards are located usually in the mountains, and they form one of the chief obstacles to mining or railroad enterprises, so great is their number and extent.

If a clan should wish to buy a portion of the unoccupied burial ground of another clan and be refused, secret burials are sometimes made on such land. The removal of these intrusive remains has often led to friction between the clans, for interments of this kind are believed to affect the fecundity of the clan.

It is said that when a marriage is not fruitful the matter is brought before the council and inquiry is made, especially if the complainants are wealthy, as to whether the ground is inviolate.

A few Buddhists burn their dead. The usual Korean method is to bury at full length, in the customary clothes, and to wrap the body in coarse hemp cloth before placing it in a coffin. Often the dead are required to be carried long distances to the clan graveyard. Over the grave a mound of earth is heaped up, and this is soon covered with short, velvety grass.

Laws of the Clan.—The prohibition of marriages between members of the same clan name, which seems to be a world-wide custom, is a prominent feature of Korean sociology. It is more than a law with penalty for infraction; it is a traditional custom of which the negative is inconceivable. The civil law against remarriage by a widow is said to have originated in the necessity of prohibiting the doing away of one husband with the view of taking another. The marriage of a deceased wife's sister is no more to be thought of in Korea than is marriage within the clan.

Offences and Penalties.—The clan laws take cognizance of three or more offences against the clan and prescribe the punishment therefor. If a member becomes a traitor against his country he is expelled from the clan and thereafter forbidden to use the clan surname. This penalty is more severe than may appear at a glance, because it amounts to excommunication from the ancestors, and ancestral worship is the central idea of the clan. Another offence is illicit intercourse between families, which strikes at the root of the clan marriage system. This offence may be punished within the clan, but if it becomes known the civil authorities take cognizance of it. The clan penalty is excommunication.

The third major offence is disrespect to parents or to old people. This infraction is usually corrected by the clan, but when the offence is glaring or repeated, it is punished by civil law.

Support of Poor Members.—In countries like China and Korea where filial piety and respect for the aged are inculcated (this, however, apparently within the clan), the support of poor members of the clan does not often require attention. The support and succor of indigent or unfortunate members by the clan seem not to be obligatory, nor do they appear to be a part of the system of coöperation, but are effected through charity. No doubt the claims of relationship are strong enough to be the moving factor in all such cases.

Adoption.—Korean families are prevented from becoming extinct by the custom of adoption. The rule followed is that a child of a younger generation is selected and one not in the line of descent; that is, the second male child may be adopted. The adoption of female children is rare.

Thus, perhaps, the claims of great antiquity made by some clans may not be out of reason, as that of the Kim and Ye clans of Wo Sing in Ping Yang, whose descent is said to be traceable through a period extending over four thousand years. Curiously, also, the Korean clans still live in the definite localities where they originated.

Political Parties.—The political parties which divide Korea and which at present are those of the North, South, East, and West, involve the clans on account of the localization of the latter. Clans, however, are often divided in political opinions, but this exerts no influence on their organization as a consanguineal group.

The following list of family names comprises the most important in Korea. While some of the names are taken from natural objects, no totemic devices survive according to my informant. As is customary in business, however, the clans have seals, or rather the head of the family uses his seal by virtue of descent. As is the case with the family names, none of the seals bear totemic devices.

KOREAN FAMILY NAMES

SANG YUK SEUNG OR "SIX HIGH FAMILY NAMES"

- | | |
|-------------------------|--|
| 1. Ye.....Plum | 4. Ahn.....Peace |
| 2. Kim.....Gold | 5. Cheung.....Ancient nation |
| 3. Chai.....Precipitous | 6. Pak....Dwarf nettle (<i>Ceris sinensis</i>) |

HA YUK SEUNG OR "SIX LOW FAMILY NAMES"

- | | |
|------------------------------------|------------------------------------|
| 1. Ta.....Great | 4. Chu.....Autumn |
| 2. Pi.....Hide or skin | 5. Cha.....Cart or wheeled vehicle |
| 3. Pang.....Name of a feudal state | 6. Reum.....Humble and wise |

OTHER FAMILY NAMES

- | | |
|---|---|
| Such or Soh.....Slow | Wan.....A long robe |
| Peun.....Frontier | Ur.....Fish |
| Meung.....Bright | Ha.....Milky-way |
| Wang.....King | Song.....Name of a dynasty |
| Ye.....Pear tree | Ruk.....Dry land in contrast to water |
| Mun.....Literary | Yeur.....A musical pipe |
| Chun.....Heaven | Poong.....Water sprout |
| Chun.....Thousand | Mya.....A sorceress |
| Yong.....Dragon | Ma.....A horse. A knight in Korean chess |
| Puang....."Son of the Heavenly bird" | Goo.....Implements |
| No.....Mule | Ham.....All, entire |
| Ho.....Door | Han.....An ancient nation |
| Chung.....One of the ten stems | Rim.....Forest |
| Heun.....Black | Chang.....Publish |
| Go.....High or lofty | Pum.....Plant, grass |
| Hor.....Promise or permit | Pai.....Long robe |
| Kang.....The name of an emperor (B.C. 233), Sin Nong, the inventor of agriculture | Parn.....Rice water |
| Min.....Mourn or grieve | Pang.....Square |
| Yu.....Willow tree | Peun.....Rule |
| Yu.....The name of an ancient principality | Sung.....Finished or complete |
| Pak.....White | Sin.....A name of a state |
| Hong.....A flood, overflowing | Sin.....Messenger |
| Um.....Prince-like | Sin.....Acid or bitter |
| Kwan.....Power | Cheun.....Perfect |
| Cho.....An ancient nation | Nam.....South |
| Wu.....An ancient nation | Quak.....An outer fortification |
| Wu.....A thong of leather | Gun.....To direct |
| Oh.....Name of ancient nation | Woo.....A name for King U who lived 2200 B.C. |
| Sok.....Ancient | Nam-Koong.....South palace |
| Sok.....Stone | Neuk.....A surname |
| Wan.....Chief | Ro.....Name of a wild tribe |
| | Gin.....To marshal |

"REAL," "TRUE," OR "GENUINE," IN INDIAN LANGUAGES

By ALBERT S. GATSCHET

When we desire to convey the impression that such a man is a typical Frenchman in body and mind, in manners and language, that is, an embodiment of all that is French, we mean that he is a *true* son of his country. There is nothing uncommon in this, no more than there is in the fact that the continental Greeks once called the inhabitants of eastern Crete the *Eteocretes*, or true, genuine Cretans, which meant that they had remained free from admixture with the Carian or with any other race. The same idea is expressed by the Germans when they call the Czechian, or Slavic-speaking population of Bohemia, *Stockböhmern*, for these, who form three-fifths of all Bohemians, are thereby regarded as belonging to the old and original stock of the population. The designation, however, sounds like a nickname, through its intimate analogy with terms like *stockblind*, *stocken*, *stockig*, *Stocknarr*. In the same way the application of the term "Hibernian" to a typical Irishman would sometimes be regarded as banter.

Similar designations have been found to a considerable extent in the languages of more primitive peoples, referring to persons and other animate beings as well as to inanimate objects, which bear nothing of the jocose or bantering in themselves, but are applied seriously. Some of the terms are so quaint, curious, idiomatic, and attractive, that I resolved to collect a number and subject them to careful study, regarding them as true and palpable products of the aboriginal mind.

The terms for "true" or "genuine" in most of the idioms to be mentioned are simultaneously adjectives and adverbs, and,

curiously enough, with a slight change in pronunciation or suffixion they also mean "man" and "Indian."

ALGONQUIAN

The Algonquian languages, which are among the most thoroughly studied of all the North American tongues, yield many curious instances of the intention of the natives to convey the equivalent of "genuine." The two words chiefly used by them in this sense are *lénia* or *léní*, and *iníni*; both are etymologically identical, with the phonetic change from *l* to *n*, and both stand for "man" and for "genuine" with their various synonyms.

Peoria, Miami.—Among the Indians formerly settled in Illinois and Indiana, *léní*, *lāni*, is the word for "real," "genuine," and *lā'nia* for "man," "male," and "Indian." But the Shawnee, whose ancient home was farther eastward from Mississippi river, use *hiléni* for all the above terms. In Peoria and Miami *lāni kú'sia* is "muskrat," i.e., "the real mouse" or "the genuine rat"; *léní mahúéwa*, "prairie-wolf," literally, "the genuine wolf," or, more accurately, "the genuine jackal." *Lenapizha* or *Lānapizhia* is a mythologic name sometimes applied to persons and totemic clans. It is interpreted "whale," "monster," "water-monster," and designates any large animal. The Lenapizha is said to live in the water and to become visible only when lightning strikes a lake or river. A literal rendering of the name is "the real tiger," for *pizhi* is identical with the Ojibwe *bishiw*, *pizhiu*, "wildcat," "tiger," "tiger-cat," and would apply also to the cougar of Central America and South America. The term for "right," as opposite to "left," also contains *léní*; the Miami say *lānad-shónshi anéki*, "right hand." The form *iníni* is represented in Peoria, Miami, and other dialects also, but not as a substantive; it is the demonstrative pronoun "that one," "that," referring to distance (*hine* in Shawnee), whereas *uníni* is "this one," "this here," close to the speaker.

Shawnee.—The Shawanoa or Shawnee dialect of Algonquian

employs *hilēni* (abbreviated *lēni*) for "real," "genuine," and the same term is in use for "man" and "Indian." *Hilen-akui* or *hilen'-dku* signifies "bow," "war bow," anciently made of iron-wood and hickory; this compound means "real wood," for in Shawnee "bow" and "wood" are expressed by the same generic noun, *dku*, inseparable from the noun that qualifies it. In the same manner the heavy arrow or war arrow was named *hilen' alwi*, abbreviated *len' alwi*, *lenalūi*, literally "genuine or true arrow," to distinguish it from the hunting arrow, bird arrow, or toy arrow. The "red man's tobacco" the Shawnee call *hilēni lithā'ma* or *hilēni ilathā'ma*; it is a mixture of badger willow bark with the leaves of *Uva ursi*, etc., and, as "genuine," must be kept distinct from the white man's tobacco. The Indian or "true" pumpkin, *hilēni wāpikwi'*, was a plant of miraculous origin, for it was supposed to grow only where lightning had penetrated the earth.

Delaware.—Of the Delaware dialects the Unāmi or Wonāmi is accessible to us through two copious but not quite satisfactory dictionaries, from which we learn that *lenno* (plural *lennowak*) is "man," "male," "Indian," and *lenni*, "genuine," "pure," "real," "original." *Lendpe*, *Lenāpi*, is an Indian of pure race, and *lenni Lendpe*, as an augmentative of the above, is the "Indian of pure descent," unaltered from his ancestors in blood or body, in sentiment or customs.¹ The Delawares applied this name formerly to themselves, for the people of every tribe believe themselves to be superior to every other. Their neighbors, the Shawnee, now call them *Lenapégi*. A certain species of fish, the "chop fish," is called *lenn-dmek*, "true fish," in the Unāmi dialect; and *lennahawanink* means "at the right hand," "to the right."

Nipissing.—In the Nipissing dialect of Ojibwe, spoken on upper Ottawa river and at Oka, or the mission of the Lake of Two Mountains, there are quite a number of instances which

¹ The term *-ape*, *-api*, "standing," "erect," is an inseparable suffixed noun which occurs in all eastern Algonquian languages with the signification of "person," "man," "Indian."

illustrate the idea of "genuine." *Inini* is "man," "Indian" (plural *ininiwak*); but *inin* is "true," "natural," "genuine," or "par excellence." From the Abbé Cuoq's copious *Dictionnaire de la Langue Algonquine* the following are gleaned: *Inini kôman*, "hunting knife," carried in a sheath or scabbard, lit. "real metal"; *ininipto*, "(this horse) is a good, 'genuine' trotter"; *inin andak*, "pine tree," "real tree," lit. "tree of evergreen branches"; *inin ashkwadyi*, "bark from which to make canoes," lit. "true bark"; *inin dsin*, "flint," "silex," lit. "real stone," "live stone"; *inin dtik* (*a* short), "cariboo," lit. "true or real beef or cow," *dtik* including any species of the bovine family; *inin âtik* (*â* long), "maple," lit. "the true tree," called also the national tree of Canada (*âtik* refers only to deciduous trees); *inin mitik*, "hard wood," as oak, etc. (in Canadian French, *bois franc*, as distinct from *bois mou*); *inin Wemitigôshi*, "a Frenchman of France."

Cree.—In the dialect of the western Cree or Kinisteno the terms *inini* and *inin* appear with slight consonantal change, as *iyiniw*, "man," and *iyinato*, "true," "real," "principal." Père Lacombe, who has studied this dialect carefully and published the results in his *Dictionnaire et Grammaire de la Langue des Cris* (Montreal, 1874), gives instances of their use, from which we gather that the Cree Indians call themselves *Iyiniwok* (from the radix *iyin*, "pure" and "first"), not because they believe themselves to be the first of men, but because they regard themselves to be still in a natural state. Whether or not this is the correct explanation of the term, it is certain that *iyinato* (abbreviated *n'tôk*), which is adjective and adverb simultaneously, corresponds closely to *lêni* and to the Iroquois *ôuwe* below, and means "true," "real," and "truly," "really"; *iyenato iyiniw*, "a genuine Indian"; *iyenato ayamihâwin*, "the true religion"; *n'tôk kissin anotch*, "it is really cold today"; *iyinato naspitâtuwok*, "they resemble one another extremely well"; *iyenato Wemistikosiw*, "a Frenchman from France," "a true Frenchman"; *iyenato pimâttsiwin*, "the true life"; *iyenato sominabûiy*, "unadulterated or unmixed wine."

Arapaho.—Of the western Algonquian dialects in the United States, that of the Arápohe or Arapaho yields a few instances of the linguistic feature occupying our attention. Here the term for "man," "male," *inen*, *hinén* (plural *inén'na*), differs from that of "genuine," which is expressed by *athine*; e.g., the red flinty maize is the "true corn" (*athine beshkatá*) for making hominy. *Ahát*, "cottonwood tree," a species of poplar, is also called *athina*, or the "true tree." In the arid region the cottonwood is frequently the only tree to be found, hence *ahát* came to mean also tree in general. *Háthina tó-ukthelhi* is "sheriff," lit. "true or real policeman," the latter vocable meaning properly "person tier." Some western tribes designate the bison by a term signifying "real bull or beef." The term for "man" has probably named also the Arapaho tribe, for *hindna* or *inn dna inén* is "an Arapaho man"; *inn dna issé*, "an Arapaho woman."

IROQUOIAN

Mohawk.—The language of the Iroquois of New York comprises six dialects: one of these, the Mohawk, was transferred to Canada and is now spoken at Brantford on Thames river, Ontario, and at Caughnawaga on the St Lawrence, in Quebec. In Mohawk the term *ónwe*, "true," corresponds to the *leni* and *inin* of Algonquian dialects, but it also includes permanence, stability, perpetuity, immutability, and is used adverbially as well. Thus we have *ónkwe ónwe*, "true man," which signifies "Indian" as well as "Iroquois Indian"; *óhasera ónwe*, "common candle," as distinguished from *óhaserato kéniti*, "ceremonial or church candle"; *kanatarok ónwe*, "true bread," i.e., that made by Indians; *Onserónni ónwe*, "Frenchman proper," "native of France"; *Tlorhensdka ónwe*, "native Englishman."

KIOWAN

Kiowa.—These Indians do not use a special word to express "real," "principal," or "true," but they append a suffix, *-hi* (nasalized *hi**), for the purpose, according to Mr Mooney. For

example, *tse*ⁿ, animal, horse; *tse*ⁿ*hi*, dog; *gúāto*, bird; *guātóhi*, eagle; *sāne*, snake; *sānchi*, rattlesnake; *ā*, tree (*āto* usual form); *āhi*ⁿ, cottonwood tree.

SHOSHONEAN

Comanche.—The term *tibitsi* appears to fulfil this function in the Comanche language; it means "true" and "very"; *tibitsi nem* is the "genuine nation," meaning the Comanche themselves, who call all nations differing from them *atawitch*. *Tibitsi būr* (or *per*) signifies the right or real arm; *shini būr*, the left arm.

TONKAWAN

Tonkawe.—The Tonkawe or Tonkawa tribe of Texas, whose ancient habitat is difficult to determine on account of their former migratory habits, call themselves *Titchkan-wdtitch*, "indigenous people." *Atak* in their language corresponds to the Algonquian *leni* and *inini*, and is used adjectively and adverbially. One of the eight Tonkawa clans is called *Titskan-wdtitch dtak*, "real Tonkawas," anciently so called; *ekwōdnshxo dtak*, or "real horse," is a gelding, because these were regarded as the best horses for use in battle; *niswōdlan dtak* is "catfish," a species of which, found in Clear fork of the Brazos, is said to reach a length of five feet and to weigh eighty pounds. *Sēnan dtak* is "milk-snake," and is called "real," "true," on account of its brilliant coloring; hence also its other name, *sēnan taxdshr*, "sun-snake." *Tchūxa* or *tchūxa dtak* is the name of the common field-mouse, but another and rarer species is called *tchux esān* or "bogus mouse." Adverbially the term appears in such phrases as *dkun dtak*, "positively, surely a man"; *wūsh atak*, "just now"; *tēna-i dtak*, "long ago." Right and left are expressed in another way: *yākwān hē-i*, the right leg, is the "strong leg"; *yākwān wōdse-i*, left leg, is literally the "leg on the other side."

NORTHWESTERN COAST LANGUAGES

Selish—Kwakwintl.—Concerning the languages of the Pacific states and territories I have received a few indications from Dr

Franz Boas, who has made a special study of the coast dialects. According to these, the Selish dialect of the Nlakyapamux, in British Columbia, expresses the idea of real or genuine by the suffix *-o't*, and the Kwakiutl of British Columbia by *-kyas*. These terms show no affinity, however, with the word for "man" or "Indian" in the dialects to which they belong.

Chimmesyan.—Of this language, the Nis̄xa dialect has *sēm* for "real," "true," and "really," "truly." Examples of its use are *sēm-gig a't*, "real men," i. e., the nobility; *sēmhala-i't*, "real shaman or conjurer"; *sēm hēsuk*, "early morning"; *sēm-g'a'a*, "to look thoroughly." The prefix *alō-*, when followed by a word in the reduplicated form, means "alone," "by oneself," "by itself"; thus, *alōg'ig'a't*, "Indian," is literally "alone man."

Investigation of the languages of Mexico, Central America, and South America has yielded but few terms that can safely be regarded as parallels with the above.

Perhaps the most interesting result to be derived from what has been recorded is the close affinity between the terms for "genuine" and those for "man." There can be hardly any doubt that "man" or "male" is the primary word or concept, for concrete nouns always precede terms which express abstract ideas; therefore, the idea of "man," "human being," individualized to "man of our own tribe," must have been the prototype of the terms for "real" or "genuine."

The subject-matter of this paper gives rise to many similar problems to be solved by the comparison of terms of subtle meaning in various languages. Among these occur the questions why European languages are so fertile in augmentative forms, while native American dialects are so deficient in them; why inseparable generic nouns are much more frequent in American than in Aryan compounds; and why certain classifiers, figuring especially as suffixes to adjectives, occur so frequently, especially in the numerals, in the languages of the western continent.

THE ADOPTED ALGONQUIAN TERM "POQUOSIN"¹

By WILLIAM WALLACE TOOKER

Among our numerous adopted Indian words the subject of this essay survives in local parlance in some parts of the Carolinas, Virginia, and Maryland, as a topographical term for low lands or marshes. Its lexicographical variations are *pocoson*, Worcester (1846); *pocoson*, or *poquoson*, Bartlett (1859); *pocosan*, De Vere (1872); *pocosin*, in the Century Dictionary, and *pocoson* and *poquoson*, in the Standard Dictionary. As it is surely time for lexicographers to agree on some standard spelling, we have selected '*poquosin*'—a form more generally prevailing in print and representing more clearly the original phraseology—as the proper spelling.

These swamps, wrote the late Prof. J. D. Whitney,² "are locally known as '*dismals*,' and also as '*pocosins*,' the latter word being apparently an aboriginal name, and, if so, one of the very few instances (if not the only one) in which a word of this kind has become—to a limited extent, it is true—generalized as a topographical designation."

Mr W. G. Stanard, who has devoted much study to the land patents and other records of Virginia, writes³: "*Poquoson* is an Indian word meaning marsh or low ground. There is frequent mention in the patents of land being bounded by, or being in part a '*poquoson*.' Not long ago a North Carolina paper referred to the '*poquoson* lands' on the Roanoke."

¹ The writer must acknowledge his indebtedness to Albert Matthews, Esq., of Boston, for collating the extracts relating to the use of the word '*poquosin*,' without which this paper probably would not have been written. If those desirous of learning the meaning of our early Algonquian place-names would be as thorough in their search for early forms as Mr Matthews has been in this instance, there would be less difficulty in tracing their etymology.

² *Names and Places*, 1888, p. 211.

³ *Virginia Mag. of Hist. and Biog.*, vol. IV, 1896, p. 202.

The earliest printed examples of this topographical application are given by John Lawson,¹ as follows: "As we row'd up the [Santee] River, we found the Land towards the mouth and for about sixteen miles up it, scarce anything but swamp and *percoarson*, affording vast Ciprus-trees of which the French make canoes." On the margin of this page (9) occurs "*Percoarson*, a sort of low land." Lawson further recites: "The swamp I now spoke of, is not a miry bog, as others generally are, but you go down to it thro' a steep Bank, at the Foot of which begins this valley, where you may go dry for perhaps 200 yards then you meet with a small Brook, or Run of water, about 2 or 3 feet deep, then dry Land for such another Space, so another Brook, thus continuing, the Land in this *Percoarson* Valley, being exceedingly rich." Again he wrote: "The first night we lay in a rich *perkoson* or low ground, that was hard by a creek, and good dry land." In the 1860 edition of Lawson's work, the word is modernized as '*Pocoson*.'

A deed of 1714² mentions the following boundaries "to an old gum standing by the side of a *Poquoson*, dividing this land, and the land now in the possession of John Dawley, thence running down the East side of s^d run *poquoson* and marsh to muddy creek." William Byrd³ (1729) frequently mentions the term, but more especially descriptive is the following: "By the Pilotage of these People we row'd up an Arm of the Sound called the Back-Bay, till we came to the Head of it, there we were stopp't by a miry *Pocoson*, full half mile in Breadth, thro' which we were oblig'd to dabble on foot plungeing, now and then, tho' we pickt our Way, up to the knees in mud." The term was also frequently used by George Washington⁴ (1763), for example, "Black mould taken out of the *pocoson* on the creek side."

¹ *History of Carolina*, 1709, pp. 9, 26, 57, 115.

² *William and Mary College Quarterly*, vol. 18, 1895, p. 22.

³ *History of the Dividing Line*, vol. 1, 1866, p. 29.

⁴ *Writings*, vol. 1, 1889, p. 163.

W. B. Rogers¹ wrote in 1836: "At *Pocosin*, a flat swampy country, which is often inundated by the tides, this deposit is uniformly met with by digging a few feet." By the adoption of the term by the colonists it was applied to all tracts of land more or less saturated or covered by water, where no Indian would have used it so commonly. This use is shown by W. C. Kerr,² who wrote:

"There is a large aggregate of territory (between 3000 and 4000 square miles) mostly in the counties bordering on the seas and sounds known as Swamp Lands. They are locally designated as 'dismals' or '*pocosins*,' of which the Great Dismal Swamp on the borders of North Carolina and Virginia is a good type. They differ essentially in their characteristics from ordinary swamps. They are not alluvial tracts or subject to overflow. On the contrary they occur on the divides or water sheds between rivers and sounds, and are frequently elevated . . . above the adjacent streams."

Still earlier than any of the foregoing, the term was employed in 1635 as a river designation, by B. Symmes³ who wrote: "For the education and instruction of the children of the adjoining parishes of Elizabeth City and Kingston, from Marys Mount down to *Poquoson* river." This was in North Carolina. In 1692 a record of Virginia stated⁴: "Upon y^e petcon of y^e pishioners of new *Poquoson* in y^e County of York [it was ordered] y^e from hence forth forever hereafter y^e s^d pish Church shall be called and named Charles Church and y^e river formerly called *New Poquosin* River shall be for time to time and at all times hereafter be called named and written Charles River." The editor, Dr L. G. Tyler, adds to this quotation: "The change, however, only partially prevailed. The parish became known as Charles Parish but the river is known to day as *Pocosin* River." [*Pocosan*, 1775, Map of

¹ *Report of the Geological Reconnaissance of Virginia*, p. 23.

² *Report of the Geological Survey of N. C.*, vol. 1, 1895, p. 13.

³ *Virginia Carolorum*, Neill, p. 113.

⁴ *William and Mary College Quarterly*, vol. 1, p. 21, note.

Virginia, by Frey and Jefferson; *Poquosin* river, and *Poquosin* flat, Coast Survey chart.]

Many similar examples, from these and other early sources could be quoted to show that the term was invariably applied to low tracts of land in close proximity to creeks or other bodies of water, and occasionally to land subject to overflow from one cause or another.

By consulting the foregoing authorities, it will be observed that the opinions of the lexicographers and others as to the meaning of *poquosin* have been based on the supposition that it was an Indian word for "a swamp or marsh." In most cases, certainly, as the extracts have indicated, such is the meaning apparently attached to it in English; but the question has lately been presented for a decisive opinion as to whether such was the actual meaning attached to it by the Indians. We say it was not, and in order to substantiate our opinion, and to show the true signification of the term, this paper has been prepared.

The word undoubtedly had its origin among the natives of the coast who spoke the Algonquian language, for it was these people with whom the colonists first came in contact. Moreover, the same identical elements, in varying dialectal or corrupt forms, employed with precisely the same descriptive meaning, and applied to similar topographic features, abound as place-name designations throughout the whole eastern Algonquian area.

Not only is this a fact, but in the lonely forests of Maine the radical again appears in its generalized sense in *pokeloken*, a word used by hunters and lumbermen to denote a marshy place or stagnant water extending into the land from a stream or lake.¹

The question now claiming our attention relates to the analysis and etymologic derivation of the term. The first component, *poquo*, as commonly employed and as first written by Semmes in 1635, or *percoar*, as rendered by Lawson in 1709, is paralleled

¹ W. R. Gerard in N. Y. *Sun*, June 30, 1895.

by the Massachuset (Eliot) *pohqui*; Narraganset (Williams) *pauqui*; Mohegan (Pierson) *paughke*; Abnaki (Rasles) *poo'koo it*, "to open out," "to widen" (primarily "to break"). The terminal *-sin* is the regularly formed diminutive in *s*, with a locative, corresponding to the Lenápe *-es-ing*; Massachuset and Narraganset *-es-et*, or *-es-it*, denoting "at or near" (something understood). Trumbull¹ remarks as to the use of the locative in *et*: "It locates not the object to the name of which it is affixed, but something else as related to that object, which must be of such a nature that location can be predicated of it." Therefore, from this analysis we have the compound word *poquo-es-in(g)*, "at or near the opening out or the widening." Compare, Otchipwe (Baraga) *pákisse*, "it breaks open"; *pákissin*, "it is open," plural *paiákissing*, "it opens"; Abnaki (Rasles) *psaŋgawo essen*, "*La rivière est pleine b'p [beaucoup] d'eau, v. g. printemps.*" The application of the term, therefore, in its linguistic sense was to indicate or to describe localities where water "backed up," as in spring freshets, or in rainy seasons, which, by reason of such happenings, became necessarily more or less marshy or boggy. In a valuable list of our adopted Indian words, contributed to a New York paper (*Sun*, June 30, 1895), W. R. Gerard suggests: "The word *Poquoson* apparently means 'place where there is but little water.'" This is a very good guess, for, as we have shown, there is something "little" in the word, but it is not water.

Heckewelder,² in suggesting a meaning for the Virginia river "*Poccosen*," derived it from "*pduckassin* [literally round-stone], the place of balls, bullets, lead,"—a nonsensical etymology; but he was fully as far from correct in his etymology of "*Poquessing*," the Lenápe equivalent (*Poquesson*, *Poetquessing*, *Poquessing*)³—a creek flowing through meadow lands toward its mouth and emptying into Delaware river between Philadelphia and Bucks

¹ *Indian Geographical Names*.

² *Names, etc.*

³ *Colonial Records of Pennsylvania*, vol. 1, p. 126; *Archeology of Pennsylvania*, vol. 1, pp. 116, 117.

counties, Pennsylvania,—which, he wrote, was corrupted from "*Poquesink*, the place of mice." The late Dr J. H. Trumbull¹ regarded *Poactquessing*—an Indian village at the mouth of this creek mentioned by Campanius—as a disguised *Pawtuxet*, wherein he was mistaken, for the latter name belonged to the falls at Trenton.

On Long island, New York, four miles south of Sag Harbor, near Sagaponack, is a locality and a pond called "*Poxabog*," but more correctly termed *Paugasaboug* according to aboriginal pronunciation. Its main stem was variously written *Pougoso*, *Pogase*, and as *Pockgase*, which accounts for the modern survival. A survey of 1712, laying out the land thereabouts, reads: "Runs into a Litel slade for water ner *paugaseboug*." This name is not a compound of Indian and English, neither is the terminal a "bog," as might be assumed, but is the Algonquian generic *pang*, which, in Long island Indian names, has the form *boug*, "a pond, or a water-place," the whole "an opening-out water-place"—a translation accurately describing the low boggy tract where "*Poxabog* pond" spreads out, as it is doing at the present time, being wider and more open than has been observed in some years. "*Poxabog* road," very good in dry seasons, is now three feet under water and impassable. "*Poxabog* brook," a ditch dug in the last century connecting with "Sagg pond," carries off the surplus water, otherwise the whole neighborhood would be flooded. *Quassapang* pond, in the northwestern part of Middlebury, partly in Woodbury, Connecticut, the source of Eight-mile river,² is probably the equivalent of our *Paugasaboug*, and was originally *Poquassapang*, and not, as Trumbull suggested, from "*k'che-pang*, i. e., the greatest pond."

Pocasset pond and Boggy meadow at Portland, Connecticut, have the same natural features. On modern maps it is "*Pecanset*." In a deed of 1678, it is the "boggy meadow in *Pacousett*."

¹ *Indian Geographical Names*, p. 9.

² Trumbull, *Names in Connecticut*, pp. 56, 60.

Rhode Island has its quota in two "*Pocasset*" rivers: The one in Tiverton gave the name to a hill as well as to the country thereabouts, where the "*Pocasset*" sachemship had its home in former times; the other is in Johnston, and empties into Pawtucket river, just above the city of that name. There are also "*Pocasset* meadows" in Sandwich, Massachusetts. *Pequusset*, and *Pigsusset*, were the meadows "at the widening" of Charles river, Watertown, Massachusetts, and represent other variations. "*Pecowasic*" brook, flowing down "*Pecowasic*" valley, through the "Agawam" meadows, at Springfield, Massachusetts, is another. *Pawgasset* (1642), *Paugasset* (1672), the low land and meadows at the junction of Housatonic and Naugatuck rivers at Derby, Connecticut, gave the name to the "*Paugasset*" tribe in the annals of Housatonic valley. President Stiles¹ of Yale College wrote the name, as pronounced by a *Paugasset* Indian, *Pawghkeesuck*.²

Among the correspondences are some with an additional prefix. For instance, at Montauk, Long island, near the "Ditch plain" Life-saving station, bordering Camp Wikoff on the southeast, lies another low tract of marsh and bog, through which a ditch was dug in the seventeenth century in order to carry off more expeditiously the "backwater," from "Great pond" into the ocean. This locality formed a boundary described in an Indian deed of 1670, and was then called *Choppausha-paugasuk*, i. e., "a place of separation where the outlet opens out or widens." The marsh was no doubt impassable in early days, and even now travel over it is by a bridge and a filled-in road.

On the northern side of Martha's Vineyard, in the town of Tisbury, is a marshy section through which flows a brook once called *Weechpogusset*. In a deed of May 28, 1669, for the "Christian Town," it is stated: "The bounds of the said land is on the north side of Island bounded by the land called *Ichpogussett*." In 1699 the same was "bounded on the East by *Ichpogussett* the black water." We believe "black water," as here written

¹ Manuscript, 1761.

² Trumbull, *Names in Connecticut*, p. 46.

and perpetuated in local speech, to have been an error in some way for "back water," which carries out the idea embodied in its Indian name. In 1703 a doubt arose as to its exact location, so a committee "of adged and chief Indians," of Tisbury, was appointed "to show the place that is called *Weechproquassett* creek or water on the bounds between the lands called *Chickammo* and the Sachemship of Takemmy." This committee decided "that the brook of water that runneth into the Sound being to the eastward of *Onkkokemmo* pond is the only ancient place called *Weechproquassett* and the true line." This is earlier confirmed by the grant of "Tisbury Manor," dated July 5, 1771, where "a brooke called *Each-poo-quas-sitt*" is described as the westerly bounds of *Chikkemoo*.¹ The prefix *Ich-*, *Itch-*, *Each-*, or *Weech-*, as variously written, is the Massachuset (Eliot) *Weeks* or *Wehqs*, "as far as," the "edge," "brim,"—hence, as a whole, "as far as, or to the end of the opening out."

At the southeastern part of the town of Barrington, Rhode Island, is a neck of land now called Rumstock, but known to the Indians as *Chachapacassett*. The eastern side of the neck borders on Warren river, and has a wide margin of meadow, salt-grass, and thatch. In addition, about one-fourth of the area of the neck was subject to overflow at spring tides, and is of a marshy and boggy character. *Chacha-pacassett* (= *K'che-pacassett*) was therefore "at the great widening" of Warren river.²

Among the corrupt forms of apparently no connection with the subject term of this paper at first glance, are *Sowassett*, Long island, and *Poughkeepsie*, on the Hudson.

B. F. Thompson, the historian, wrote of the former³: "The Indian name of Port Jefferson, L. I., was *Sowassett*, and the cove between it and Setaukett was *Poquott*." After considerable inquiry as well as personal search, Thompson is the earliest

¹ Advance notes from a prospective *History of Martha's Vineyard*, by Chas. E. Banks, M. D., U. S. Marine Hosp., Washington, D. C.

² See Bicknell, *History of Barrington, Rhode Island*, 1898, pp. 11, 32, 36, 280.

³ *Proceedings of the N. Y. Historical Society*, 1845, p. 131.

authority for these two names whom we have been able to discover. They may have survived in tradition up to his day, or he may have found them in some early deed unknown to us. Whichsoever this may be, they have every appearance of some mistake according to our present view, and the two are more likely to have been an original *Poquossett*. This suggestion is apparently confirmed by the fact that Port Jefferson was earlier called "Drowned Meadow."¹

So far as the name *Poughkeepsie* may be concerned, there appears to be absolutely no question as to its primal identity with the others, and that it was not derived, as Schoolcraft concluded, from "*Apokeepsing*, a safe harbor," as no warrant can be found for that form nor for such a translation. A deed of 1680,² to Arnot Velle, for the land thereabout, recites: "Beginning at a creek called *Pacaksing*, . . . to Wápangis Creek along Hudson's River northward to *Pacaksing*"—a form which, by various stages of degradation (among which are *Pocapsing* and *Pogheapsing*),³ has finally resolved itself into *Poughkeepsie*. The survival and retention of such evolutions in Indian place-names present nothing remarkable nor surprising when we find a scholar like President Stiles writing "*Paugasset*" direct from the lips of an Indian as *Pawghkeesuck*, which was strictly in accordance with the Mohegan dialect; but such variations show the capriciousness of the early forms into which the gratuitous insertion of a letter would have made it *Pawghkee (p) suck*, from which, to *Poughkeepsie*, the transition would have been still easier even in that name.

This terminates the correspondences of "*Poquosin*," so far as it has progressed, but the list can by no means be complete. The lessons taught are the very close similarities in structure, as well as in meaning and application, among the various dialects of the Algonquian language, as spoken from its extreme limits in the south nearly to its northern boundary.

¹ Prime, *History of Long Island*, p. 226; Thompson, *History of Long Island*, vol. 1, p. 432.

² Rattenber, *Indians of Hudson River*, p. 371.

³ Manuscript order about roads, 1754.

ANTHROPOLOGIC LITERATURE

The Philippine Islands and their People. A Record of Personal Observation and Experience, with a Short Summary of the More Important Facts in the History of the Archipelago. By DEAN C. WORCESTER, Assistant Professor of Zoölogy, University of Michigan. New York: The Macmillan Company. 1898. 8°, xix, 529 pp., 2 maps, ills.

While the greater part of this volume is a narrative of two expeditions through the Philippine islands, the first extending over eleven months and the second over more than two years, a considerable amount of valuable anthropologic material is scattered through the pages. The author is a well-known naturalist of the University of Michigan, and has done excellent work in ornithology and allied branches; and his training in accurate observation gives special value to his notes on the natives.

Besides the numerically trifling Caucasian population of the Philippines, there are certain Chinese settlements, and a considerable number of Chinese and a few Japanese resident in some of the cities; but by far the greater part of the population is native, representing more than eighty presumptively distinct tribes. These are grouped by Professor Worcester as Negrito, wild Malay, Mohammedan Malay or Moro, and civilized Malay. The Negritos, supposed to be true aborigines now nearly displaced by the Malay, exist in scattered remnants.

"They are a wretched, sickly race, of almost dwarfish stature. Their skins are black, their hair is curly, their features are coarse and repulsive. They practice agriculture little, if at all, living chiefly on the fruits and tubers which they find in the forest, and on the game which they bring down with their poisoned arrows. Mentally they stand at the bottom of the scale, and experience seems to have proved them incapable of civilization" (p. 438).

Certain tribes, *e. g.*, the Tagbanua, are considered to be hybrids produced by intermarriage between the Negrito and the Malay; while certain peoples are supposed to have descended from the Chinese invaders under Li ma Hong, who landed on Luzon about 1573. The Tagbanua are partly civilized, partly wild; the latter received special attention. Their houses are of palm and bamboo, commonly small and often

perched high on poles so as to be reached only by means of ladders. Their chiefship is nominally hereditary, though the will of the people is final; trial by ordeal prevails; theft is punished by fine or beating, and polygamy is forbidden; wives are purchased from their fathers (indicating patriarchal rule); child marriage is common, and children may be betrothed before birth, while divorce is effected by a payment from the party desiring freedom; among some of the tribe the marriage ceremony is highly elaborate; the house of a decedent is torn down and his body buried in the forest, his utensils being broken over the grave; while the corpse awaits burial the friends dread a flying monster, which is supposed to tear the thatch of houses and consume dead bodies within; they imagine a future life for the good, located deep in the earth in seven stages, the death-giant taking the testimony from a louse on the body of the decedent as to whether he was good or bad, and, in the latter case, casting him into a fire to be completely annihilated; the tide is ascribed to a gigantic crab, which lets the water into his hole when he comes out and forces it out again on his entry; they tell that the monkey was once a lazy man at whom a companion threw a stick, which changed his shape and stuck into him in such a manner as to form his tail; they have a syllabary with which they write on fresh joints of bamboo, in vertical columns. The Tagbanua of Busuanga have shamans who treat disease mystically; in case of death the selection of a place of inhumation is imputed to the deceased—different places are named while the pallbearers lift the corpse, when, if it seems heavy, the place named is considered unsatisfactory, while if it seems light the place is supposed to be preferred; the body may be carried a long distance and may either be buried in the earth or deposited in a cave, though it may be placed on a platform; the property of the deceased is left at the place of sepulture; there are subsequent ceremonies, including the chanting of an archaic song, and this one is sometimes repeated after the ensuing rice harvest.

The Mangyan of Mindoro, another little-known tribe, were observed with special care. The men wear breechclouts, while the married women wear a curious structure of braided rattan coiled about the waist and hips, to which a bark clout is attached, while the unmarried women wear a similar costume with the addition of a separate band of plantain peels about the thorax; during the dry season they have no permanent habitations, but sleep in extemporized bowers of rattan or palm leaves, while in the rainy season they huddle on platforms of poles protected by rude roofs of rattan leaves. The Mangyan of the mountains are physically superior to those of the lowlands; their noses are flat, their heads covered with abundant black hair, sometimes slightly curly, suggesting

admixture of Negrito blood; the tallest of the men measure five feet one and a half inches, and the tallest of the women four feet ten inches; the weapons are bows and poisoned arrows, while fish and small animals are trapped. The highlanders abandon the sick in fear, returning after the death to carry the body into the woods and protect it with a bit of fence and thatch. No evidence was found of belief in future life. They have an ordeal by fire for the detection of theft, while manslaughter within the tribe is punished by forfeiture of property; polygyny prevails, while polyandry is forbidden; children marry at eight years or older, the marriage being arranged by the elders. The lowland Mangyan are omnivorous, delighting in crocodile-meat, consuming carrion on occasion, and reveling in immense white grubs from the sago palm, taken alive and swallowed squirming; yet they have a rather elaborate process of extracting sago starch for food. They also abandon the sick, but sometimes steal back; if the patient is improved they succor him, but if death has occurred they flee, deserting the house with its contents, and closing paths leading to it. Afterward the relatives conceal themselves in the jungle and change their names. They place profound faith in fetishes, and evidently are controlled chiefly by fear of vague mythical potencies, though the author was unable to obtain definite ideas of their cheerless faith.

The Moro form the most conspicuous element of the Filipino population; they comprise a number of tribes of varying characteristics. They profess Mohammedanism, but most of them retain savage traits, sometimes intensified by the curious fanaticism accompanying barbaric belief; they furnish occasional examples of the culminating self-sacrifice of Mohammedan martyrdom in devotees who seek to buy eternal happiness by running amok and slaying Christians until they are themselves slain. Some of the Moro are head-hunters; others set out on the death of a relative to kill the first person they meet as a sacrifice to the manes.

The civilized Malay, as a rule, are kindly and hospitable, tolerant of any but the harshest government, fairly honest and susceptible of industrial and social improvement, although of course without the vigorous physical, mental, and moral characteristics of the Caucasian.

Though not professedly a scientific book, the work is based on personal observation and was written by a scientific man, and is accordingly well worth the attention of students. It is handsomely printed, fairly illustrated by photomechanical reproductions, and artistically bound.

W J MCGEE.

Die Sprache der Bribri-Indianer in Costa Rica. Von H. PITTIER DE FÁBREGA. Herausgegeben von Dr. FRIEDRICH MÜLLER. Wien, 1898. 8°, 150 pp., map.

This monograph appeared in the *Sitzungsberichte* of the Academy of Sciences of Vienna, and was issued about two months after the death of the distinguished editor. Professor Müller was certainly the most comprehensive student of languages of his generation, although probably not the most profound of linguists. He did not venture deeply into the philosophy of human speech, and treated languages more from their historic and ethnographic aspects.

For his knowledge of American idioms Professor Müller stood easily first, his great work, the *Grundriss der Sprachwissenschaft*, presenting the analysis of forty-two of these tongues. No one, therefore, could have edited with greater ability the collections in the Costa Rican languages made by Dr Pittier de Fábrega, the President of the Physico-Geographical Institute of that republic.

With characteristic frankness, Professor Müller acknowledges that his explanation of the Bribri verb given in his *Grundriss*, Bd. II, Ab. I, pp. 319, 320, is shown to be incorrect by the new material. He had there stated that the verb was composed of a verbal stem and an inseparable pronominal prefix, and hence the intransitive verb could be regarded as a term of possession. It appears, however, that when the subject is expressed, and sometimes when it is not, the pronominal form may be omitted; nor is the position of subject and object to the verb of a fixed character, as both may precede or follow it.

In these respects the Bribri verb differs from the plan of most American tongues. It is less "incorporative" in its morphology. But that all signs of this process are absent would be far too much to say. The regular construction is to place the object between subject and verb; and there is a class of verbs which permits the object to be infix (p. 50). It is also stated (p. 40) that the original form of the verb was a substantive with an attached pronominal increment.

Professor Pittier is of opinion that there is in the first person plural an inclusive and an exclusive form; but the editor could not find evidence of this in the texts.

In rendering the sounds of the language, the same alphabet is adopted as in Professor Müller's large treatise. The words differ widely from those in the extensive vocabulary published by William Gabb in 1875; but this is explained by his inaccuracies rather than by a change in mode of utterance. Nevertheless, Professor Pittier acknowledges (p. 26) that it is practically impossible to present an

accurate phonetic spelling, especially as the pronunciation of individuals varies, a circumstance which he curiously attributes to the indolence engendered by a tropical climate.

Both linguistically and ethnologically the original texts offered deserve comment. They are four stories or myths with an interlinear and a free translation. They tell of how the devil *Jaburá* once ate up the human race; how the good god *Sibu* killed the evil spirit *Sór-kura*; how in ancient times men were consumed by beasts and birds; and the adventures of a hunter in the house of the King of the Tapirs. They are delightfully fresh and primitive. The name of the highest good god is *Sibu*, which appears to be a derivative from *sí*, moon. To him, or to one of his forms, *Sibu-sura*, is attributed the creation of the world, and to him go the souls at death. His power of creation, like that of many demiurgic beings in American mythology, is by thought. That which *Sibu* thinks is by that subjective act realized in the objective world. Thought itself is expressed by "that which shakes the liver"; or "that which the liver hears" (*en-bi-kuk*). This notion that the liver is the seat of the intellect is also frequent elsewhere in primitive America.

The general relations of the Bribri language are fully discussed and lead to conclusions of great moment. It has no affinities with any language farther north. On the other hand, it has unquestionable and constant affinity with the other dialects of Costa Rica, including the Guatuso of Rio Frio, and with the idioms of Chiriquí, Veragua, Panama, and the northern portions of South America, notably the Cuna and Chibcha. *The ethnic line of demarcation between North and South America is the Nicaraguan depression*, just about the track of the proposed inter-oceanic canal. In the *American Race* (p. 164) I stated that this line was the mountain chain which separates Nicaragua from Costa Rica; the union of the Guatuso with the Costa Rican stock, removes the line from the mountain crests to their northern base. In this general statement we do not attach importance to the small Nahuatl colonies who had advanced south of the line, nor the possible relations of the Mazatec to the Talamancan group. These were minor historic incidents not affecting the trend of the great migrations.

The linguistic portion of the volume has an ethnographic introduction in which the author discusses the former distribution of the Indian tribes in Costa Rica, their present locations and conditions, and a special ethnologic account of the Bribri. Under the first of these subjects Professor Pittier disputes Señor Peralta's opinion of the extension of the Nahuatl in Costa Rica. In this he may be right, as local names are not always evidence of the permanent presence of the tribes

in whose tongue they occur; but in his assertion that the Guetares were "a mixture of many stocks," he is in direct conflict with the linguistic evidence. They were, as I have shown, pure members of the Talamancan stock.¹

The social relations of the Bribri are matriarchal. The children belong to the totem of the mother, and the most valued possessions of a man pass at his death to the eldest son of his eldest sister, or to his sisters. Stringent rules prevail in reference to ceremonial uncleanness, especially in sexual relations.

A remarkable statement is made as to the acuteness of their sense of smell. Not only can they distinguish by it what kind of an animal has crossed their path, but, by the intensity of the odor, what time has elapsed since it went by.

The admirable presentation of the material in this book renews our sense of the loss of the learned editor, and encourages the hope that Professor Pittier will be incited to still further researches in this productive field.

D. G. BRINTON.

Introduction to the Study of North American Archaeology. By Prof. CYRUS THOMAS. Cincinnati: The Robert Clarke Company. 1898. 8°, xiv, 391 pp., 108 illustrations.

It is a bold writer who, in the present stage of the study of American archeology, ventures to monograph that subject, and it is a fortunate one who proves himself capable of compassing the field in a satisfactory manner. Professor Thomas does not take the full risk, however, since he omits South America from consideration and passes over physical anthropology and the geological features of the subject. There is left the great body of antiquities of North America, which the author proceeds to present in a well condensed and lucid manner well suited to the purposes of an *Introduction*. Passing attention is given to tradition, language, folklore, mythology, customs, and craniology, since these branches are useful in illuminating many of the obscure corners of prehistoric times; but the monuments and minor art remains form the chief bases of the work. Admitting correctly that prehistoric archeology is yet in its infancy, he permits himself to say that this branch is not as yet a "true science," an expression that must be considered as unfortunate. The difficulty with archeology as it stands today is not that it is unlike any other field of scientific research in character, but that it has been so often treated in an unscientific manner and by writers having little conception of scientific method. It is a science

¹ *Proceedings of the American Philosophical Society*, December, 1897.

in so far as its complex and obscure data are correctly observed, treated, and applied to the elucidation of human history.

The difficulty of classifying the subject matter of archeology is pointed out by the author, and proper stress is laid on the shortcomings of European classification and nomenclature as applied to America. In presenting the subject, the objective data are arbitrarily but conveniently arranged in three great groups, viz: monuments, relics, and paleographic remains. These are not to be grouped or studied as a whole on this plan, but the continent is divided into three parts, called culture areas, and in each of these the remains are independently studied and discussed, and so far as necessary comparisons are made with the other areas and with other continents. The method, therefore, is primarily geographic and secondarily typologic or ethnic. The three divisions are the Arctic, the Atlantic, and the Pacific. The separation of the Arctic division is natural enough, and Professor Thomas refers to the separation of the Atlantic and the Pacific as follows:

"One of the first impressions made upon the mind of the student of North American ethnology is the resemblance in a broad and general sense of the features, customs, arts, and archaeological remains of the west coast to those of the islands in and countries bordering on the Pacific ocean, while on the other hand there is no such resemblance between them and those of the Atlantic slope. In other words, the types when classified in the broadest sense appear to arrange themselves in two general divisions—those belonging to the Pacific slope and those confined to the Atlantic slope" (page 17).

In chapter III a few pages are devoted to the methods of study adopted. Though the natural order of presenting the data of human history is to begin with the earliest traces of the race and to proceed in chronologic order to the latest, the author in his special field chooses to begin with the well known in native American history, and to carry investigation back along various important lines into the remote and obscure realms of prehistoric times. Thirteen pages are given to the very limited archeological phenomena of the Arctic division, and the author then passes to the Atlantic division in which he himself has been a leading investigator. Questions relating to the mound-builders claim first attention, and the matter presented possesses exceptional value, coming as it does from the pen of one so familiar with the field in all its varied aspects. His conclusions are, in brief, that the mound-building peoples were Indians (as the term is commonly accepted); that mound-building began in the Mississippi region many centuries ago and continued down to the coming of Europeans, and that the mound-builders are represented in a number of existing tribes, some of which have been fully identified. The subject of the origin and migra-

tions of the North American tribes appears prominently in this chapter. The theory of an Asiatic derivation is favored, and the general trend of the evidence is held to indicate that "the place of dispersion was in the northwest, and that the course of migration has been south and south-east" (page 162).

The Pacific division is reviewed under several headings—California section, Intermontane section, Gila Valley and Chihuahuan section, Mexican section, Southern Mexican section, and Central American section. This field is in general effectively presented, considering the aggravating lack of reliable data, while the discussion of certain features of Central American remains and culture, to which Professor Thomas has given long and careful attention, has special interest and value. The origin of the peoples he traces generally toward the north, and although suspecting intrusion of foreign elements of culture, discusses the archeologic remains from the autogenous point of view, striving with the usual lack of success to account fully for all the remarkable conditions and extraordinary phases of culture development.

In the final chapter the author presents some general considerations regarding migrations in prehistoric times. Assuming that the movement of the peoples was largely from the north toward the south, he discusses the modifications of culture brought about as temperate climes were reached and the reaction of the progress made on the northern areas. For the South American peoples and antiquities he is not able to find a satisfactory origin, as there appear to be no especially well-defined relationships with those of the North American continent.

Within the field considered, this work by Professor Thomas is far more satisfactory than anything yet written, and it must contribute not a little toward building up the science of archeology in America. It will serve admirably the purpose for which it is presented, and at the same time will form a stepping stone by means of which some other student, utilizing the fuller data of his day, may climb to higher levels.

W. H. HOLMES.

Cuba and Porto Rico with the Other Islands of the West Indies. Their Topography, Climate, Flora, Products, Industries, Cities, People, Political Conditions, etc. By ROBERT T. HILL, of the United States Geological Survey. New York: The Century Company. 1898. 8°, xxviii, 429 pp., 2 maps, 79 pls.

Although the work of a geologist, several chapters of this notable volume contain matter of interest to anthropologists. The material is derived largely from personal notes of a trained observer during protracted visits to several of the islands in the course of the last five years, these notes being enriched and supplemented by critical study of

technical and historical literature.

The chapter on the people of Cuba presents an appreciative and pleasing picture of a much-misunderstood folk, and summarizes conveniently the hereditary and industrial classes comprising the population of the island. The Cubans are classed as white, colored (*mestizo* or mixed), and black; and it is pointed out that, up to the recent revolution and the consequent Hispano-American war, the white population alone has been able to hold its own, while the blacks and *mestizos* have steadily decreased in number. "The five hundred and twenty thousand people of African descent, one half of whom are *mulattos*, represent the diminished survival of over one million African slaves that have been imported" (p. 105).

In addition to Spaniards and other Europeans, the people of Puerto Rico are divided into four classes: "The better class of *creoles*, who call themselves Spaniards; the lower class of white peasantry, known as *gibaros*; the colored people, or *mestizos*; and the blacks" (p. 166). The aborigines are entirely extinct as individuals, though there are a few persons whose hair and color indicate a mixture of Indian and negro blood. Race feeling is strong; the negroes form a numerical minority of the inhabitants, yet are contented with their lot, which "is much better than that of the negroes in the French, English, and independent islands" (p. 168).

Although a model English colony, the island of Jamaica is shown to be populated chiefly by negroes; in 1891 there were 488,624 blacks, 121,955 colored, only 14,692 whites, with 10,116 East Indian coolies, 481 Chinamen, and 3623 unclassified. "The Jamaican negroes are *sui generis*; nothing like them, even of their own race, can elsewhere be found—not even elsewhere in the West Indies" (p. 227). Though they outnumber the whites nearly forty to one, they have no voice in governmental affairs; yet they appear to retain definite traces of social organization, imported with enslaved ancestors from Africa, which doubtless facilitates governmental control. They are said to retain much or all of their primitive mythology beneath a scant veneer of the alien cult impressed by white masters. Clerical teachings have little effect on their simple minds; "only the ceremonial and emotional phases impress them; an empty bottle,—a potent power of evil,—if set down at the door of a congregation, would send it into paroxysms of fear" (p. 229). The rustling of the wind through a *ceiba*-tree, mythic dwelling-place of jumbies, instantly effaces Christian sermon and ceremony; even the educated young women of a normal school have been known to faint at sight of spilled mercury, trembling and sending forth distorted images with the shaking of the floor. Their belief is termed *obitism*; it is a faith in mystical potencies, chiefly of evil, haunting places

and things, combining with the forces of nature, attending the dead and the sepulcher, assuming protean but always animate forms—a stage of belief in which characters of zoötheism and psychotheism are curiously blent with traces of the commonly intermediate physitheism. The attendant worship is essentially secret, at least so far as whites are concerned, but is known to be ceremonial and sacrificial; ostensibly at least, the principal sacrifices are cocks and goats, though there is reason to opine that the “goat without horns” (*i. e.*, the human child) is still sacrificed in the outlying districts. In some of these districts there is a class of blacks, descendants of escaped slaves, known as maroons, who are partially free of English rule, though the author does not note especial prevalence of primitive beliefs and ceremonies among them. Even about the market places and kitchens, and indeed in the domestic schools around the white man’s house, there is no lack of primitive characters; the men tell stories of the donkey who would go hunting like the tiger, and how his courage failed, or other African tales in which the rabbit, lion, elephant, and other animals play leading roles; while every mother sings or chants an alphabet rhyme, which every Jamaican can repeat, and which has even gone into print in Jamaican primers:

A is for Assinoo,¹ see how him stan’ I
 B is for Bucks,² bery bad man.
 C is for Pusy; him name Maria.
 D is for Duppy³; him eye shine like fire.
 E is for Eel; him catch in de ferry.
 F is for Figgler⁴; him play sweet, bery.
 G is for Governor; him live at King’s House.
 H is for Dry-Harbor, place poor as church-mouse.
 I is for Myself. When I sick, I go to hed.
 J is for Jim Crow; he have a peel head.
 K is for Kalaloo,⁵ bery nice when him boil.
 L is for Lizard, but him tall ‘poil.
 M is for Monkey; just look ‘pon him face.
 N is for Nana⁶; him cap trimmed with lace.
 O is for Oliphant⁷; him have a big mouf.
 P is for Potto⁸; when night come he go out.
 Q is for Quattie⁹; I beg you one, massa, please.
 R is for Ratta; him tiptoe ‘pon cheese.
 S is for Snake; him crawl in de grass.
 T is for Toad, so farr’ard an’ fast.
 U is for Uncle. Boy, you tell him howdee!
 V is for Vervine¹⁰; make very good tea.
 W, X, Y. Hi! I really forget,
 Z is for Zebedee, mending his net.

¹ Ass, donkey.

² White man.

³ Ghost.

⁴ Fiddler.

⁵ A kind of bird

⁶ Baby

(a corrupted Spanish word).

⁷ Elephant (this word is from the old Scotch settlers).

⁸ Owl.

⁹ A fourth of a furling.

¹⁰ A plant.

The republics of Santo Domingo—San Domingo and Haiti (the "Black Republic")—are of peculiar interest to students of institutions; they are described at some length, and the striking episodes in the history of the island are recorded summarily in such manner as to show the course of a forced institutional development through the several normal stages up to an apparently premature enlightenment—a government of primitive people, by primitive people, for primitive people. The author's impressions of the Black Republic are more favorable than those of some other travelers; he does not hesitate to express the apparently just opinion that it represents "the most advanced negro government in the world" (p. 288); and he finds fair indications of intelligent progress giving promise of future order and continued development.

Much of Mr Hill's thirty-seventh chapter is devoted to a general discussion of obliism, or witchcraft, in which he acknowledges assistance from Mr W. W. Newell. He traces certain phases of belief found in the West Indies, and also in southern United States, to European contact, pointing out that the voodoo or voudou (corrupted to "hoodoo" north of Mason and Dixon's line) is more correctly rendered vaudoux, a term derived from the province of Vaudois and the sect known as Waldenses.

The volume is in every respect a most attractive specimen of book-making. It is an important contribution to American literature of the substantial sort.

W J MCGEE.

Der Ursprung der Afrikanischen Kulturen. Von L. FROBENIUS. (*Der Ursprung der Kultur*, erster Band.) Berlin: Verlag von Gebrüder Borntraeger. 1898. 8°, xxxi, 368 pp., 9 pl., 225 figures, 26 charts.

This is the first instalment of an extensive work on the "origin of culture" (*Ursprung der Kultur*) in all parts of the globe, and even a cursory inspection impresses one with the comprehensiveness of its scope. In examining this part of the work, which is devoted to the African aborigines, one is impressed by the completeness with which the results of recent exploration have been gathered and digested, and the familiarity of the author with the rich collections of African objects in European museums. In the opinion of Dr Frobenius, a study of the beginnings and the gradual development of the elements of African culture, and the observance of their equivalents or similarities in other countries, will go far toward revealing the political, social, cultural, and religious history of the people. He defines culture as by no means identical with civilization, but as the first step in the elevation of a brutish people toward a higher plane, while civilization is an aggregation of cultural elements in one people. Those who attempt to trace

the historic origin of a nation may expect to find its most ancient vestiges in its objects of manufacture—the style and forms of its weapons, its hunting, fishing, and domestic implements, works of defense, dwellings, and the like. Especially in Africa, where relics of a prehistoric epoch are almost absolutely wanting, the above articles alone, when subjected to comparative study, disclose primeval conditions.

It is the conviction of Dr Frobenius that close study of the implements, dwellings, etc., of a people discloses the transmission or adoption of the styles perceptible in them, and thereby also the migrations of the tribes or nations themselves; and by combining all the data available, the author believes it possible that all African migrations can be narrowed down to two great continental currents with a single intermediate current connecting the two. The migrations of the first current extend back and forth between Senegambia and the upper Nile in about 12° north latitude, those of the second current between the Congo headwaters and the upper tributaries of Oranje river in Cape Colony. The single intermediate current connects the eastern end of the northern current with the lake country on the headwaters of the Nile; but the territory of the middle and lower Congo, and the Hottentot or Nama country, were never subjected to direct migratory influence. But Frobenius traces influence of the people of southwestern Asia in the tribes south of the Somali countries, and presents reasons for an apparent Malayo-Nigritian style in the arts of a portion of southern Africa.

The author's conclusions regarding the migrations are based partly on fact, and, he confesses, partly on theory only; nevertheless they approach certainty, because their occurrence is substantiated by the condition of the linguistic stocks of the interior. The oldest linguistic families are still found in their earliest habitat, never having been displaced by others—for example, the stocks of the Soudan and the Hottentot family,—whereas people speaking the Bantu dialects, who now cover an enormous territory, were scattered by the intrusions of the Zulus and other tribes. In fact, the name Bantu does not designate "a race" of African men, though often mistaken to mean this; it means only a family of dialects which originally belonged to the second or north-and-south current of migratory tribes. Lately a Bantu dialect, that of the Ashingini, has been discovered as far north as 11° north latitude.

The African aborigines live mainly by agricultural and pastoral pursuits, and in some districts the stock-raising peoples hold the tillers of the soil in subjection. Those who live solely by hunting are limited to the Bushman or San race. Slavery, the result of the hostile inter-

course of tribes which have been carried along by the above-mentioned currents of migration, is almost general. In the arts and manufactures the negro is assiduous, but he lacks originality in creating new forms or types. Inventiveness is not his specialty, and art in our sense of the term is unknown to him. The more primitive man is, the less he distinguishes, in legend and story, between man and animal, or between these and certain inanimate objects, as the celestial bodies. In his myths the sun, the moon, and animals are personified, being endowed, equally with himself, with speech, mind, and shade or soul. A highly developed animism pervades all his mythology, and sorcery supplies the means of explaining mysterious natural phenomena.

The principal portion of Dr Frobenius' first volume is devoted to a description of certain classes of implements and artifacts, their genesis, history, uses, and areas of distribution. The numerous illustrations disclose many interesting details. In the north, shields are of leather; in the west they are of wood and cane; in the south, of hide; and they vary greatly in shape according to the locality. Lances, darts, and javelins are found wherever shields are in use, but where bows are commonly employed shields disappear altogether. In the north the bows are covered with leather, and their forms indicate Asiatic origin. Knives, daggers, and swords are due to a thrifty iron and steel industry which has been in vogue from an early epoch; asymmetric knives are frequently met with, the handles being of the most varied shapes.

Dr Frobenius presents a large body of information concerning other instruments and implements used by the native tribes, many of which are illustrated. With the multifarious forms of war-clubs and tomahawk-axes of hardwood and metal, throwing-clubs or boomerangs are treated, and also throwing-knives with one or several points or blades, some of which must have evolved from spearheads. Arrows are shown to have either flat or spiked points, as have the spears and darts. The native stringed musical instruments are numerous; drums and bullroarers of wood are also prominent, and communication by means of drum-signals, so familiar to many travelers, is noted. Buildings are erected of various materials, and are either hemispherical or conical, though the earthen houses form a class by themselves. The vases and smoking utensils show great diversity, as do also the sculptured objects, especially the statues and temples dedicated to gods and goddesses.

Of the colored charts accompanying Dr Frobenius' memoir, five of them illustrate the distribution of shields according to the material used in their manufacture; another chart illustrates the range of materials from which garments are made, such as skins, cotton, palm-fiber,

and bark; others exhibit the distribution of the bow within the area of the Congo basin, the Malayo-Nigritian style of dwellings, masks, clothing, tattooing, stringed-instruments, wooden drums, sirimbass, and knives. The author distinguishes seven distinct types of architecture south of Niger river, and their distribution is shown on one of the charts. Still another chart illustrates the range of banana and millet culture, as well as of pastoral life.

When a few more works of this character have been presented, much light will have been shed on the ethnography of the Dark Continent.

A. S. GATSCHE.

Truth and Error or The Science of Intellection. By J. W. POWELL.

Chicago: The Open Court Publishing Company. 1898. 12°, 428 pp.

This is a book of great and vigorous originality. The work of a special investigator in several branches of science (in two of which he has attained eminence) and a sympathetic student of the other branches, its foundation is broad and strong, and its author's warrant for putting it forth as an epistemology would seem to be ample. It is not primarily anthropologic, save in that it recognizes throughout the psychic factor which enters every sound system of interpreting nature; yet it is designed to serve as a basis for the classification of anthropology as well as the other sciences. Traversing the sphere of human knowledge as it does, condensed by years of synthesis as it has been, and written for the physicist and naturalist and metaphysician as it was, the book is not easily summarized; but three of its features may be noted briefly: 1. Throughout the author attempts to interpret nature from its manifestations in the human mind, and to interpret the mind as the most delicate and complex product of the endless interactions of nature—*i. e.*, the author sees mind as the reflection of nature, and seeks to interpret each in terms of the other. 2. Accepting the current scientific doctrine of the conservation of energy, the author extends and modifies the current form of the law so far as to recognize the persistence of energy in the particle and in the form of motion ever-changing in direction, but constant in quantity. 3. Accepting the results of modern researches in psychology, the author out-passes some of his contemporaries by recognizing consciousness (or rather the potentiality of consciousness, as this term is commonly used) as one of the primary attributes of the ultimate particle; the potential consciousness becoming effective with organization, and culminating in effectiveness only in the most highly developed organs of the highest organisms. Most

if not all of the more strikingly original features of the book may be reduced to these fundamental ideas.

A literary feature of the book is the definite terminology deemed necessary to express the comprehensive ideas set forth in its pages; the terms are to some extent novel, though far less so than the ideas which they are made to convey; and readers assimilating the fundamental ideas will probably have little difficulty in understanding the terms, though the more superficial reader will undoubtedly find the specific and definite terminology hard, even repellent. Yet few of the terms are new; it seems to have been the method of the author rather to employ old terms with restricted meaning. It is an open question whether language is better enriched by coining new terms to fit new ideas, or by redefining old terms as ideas grow more definite; certainly the author of *Truth and Error* has adopted the latter course; certainly, too, the reader will find his task difficult unless he recognizes the exceptional definiteness of the terminology extending from the introductory chapter to the summary.

The book-making is neat and simple, weakened by a dedication and strengthened by a fair index to the difficultly indexible contents.

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NOTES AND NEWS

The Butterfly and the Spider among the Blackfeet—Not very long ago, in *Forest and Stream*, I called attention to the belief held by the Blackfeet Indians that dreams are brought to us in sleep by the butterfly (*dp ánní*). As my informant said :

"You know that it is the butterfly who brings us our dreams—who brings the news to us when we are asleep. Have you never heard a man say, when he sees a butterfly fluttering over the prairie, 'There is a little fellow flying about that is going to bring the news to some one tonight'? Or have you not heard a person say after night, as the fire burns low and the people begin to make up their beds about the lodge, 'Well, let us go to bed and see what news the butterfly will bring'?"

I called attention also to the sign for the butterfly—a design roughly in the shape of a maltese cross, one arm horizontal and the other vertical, which is painted on most of the more elaborately ornamented Piegan lodges, just below the smoke-hole and between the wings at the back of the lodge. This sign painted on a lodge indicates that the style and method of painting the lodge were taught the lodge owner in a dream. More recent inquiry leads me to suspect that the influence of the butterfly is not confined to dreams but covers sleep as well.



Fig. 3.—Blackfeet butterfly symbol.

It is still a custom for the Blackfeet woman to embroider the sign of the butterfly in beads or quills on a small piece of buckskin, and to tie this in her baby's hair when she wishes it to go to sleep. At the same time she sings to the child a lullaby, in which the butterfly is asked to come flying about and to put the baby to sleep.

The word *dp ánní* appears to have some relation to *dpá wánní*, which means "talking around," or "talking in different places," "to go about telling news." *Á wánní*, "he says"; *dp á wá wá ká*, "he walks about." The prefix *dp* seems to denote presence or existence in different places.

I have not been able to learn why or how the butterfly brings dreams or sleep. It is stated merely that it is soft and pretty and moves gently and that if you look at it for a long time you will go to sleep.

How widespread the faith in the butterfly as the American sleep-

producer may be—and this cross as its sign—I do not know. My direct testimony comes only from the Blackfeet, but the belief may well have been shared by their old-time allies, the Atsína or Grosventres-of-the-prairie, and the Sarsi, who with the three tribes of the Blackfeet nation—Síktsikau, Kainah, and Pikū'nni—made up the five tribes of the "Prairie people." It is suggestive, too, that on the head of a Kútenai baby-board in my possession, there are embroidered three conventional sprays of flowers, each flanked on either hand by a cross, which certainly would have signified the butterfly as the sleep bringer, if the board had been ornamented by a Blackfoot woman. Crosses appear on two baby-boards figured in Prof. O. T. Mason's paper on *Primitive Travel and Transportation*.¹

On a very large lodge shown in an old photograph of "Southern Cheyenne wigwams," kindly loaned me by the Bureau of American Ethnology, appear four maltese crosses, quite like those shown on some Blackfeet lodges, except that they are much larger and are differently placed on the lodge, being in pairs one above the other. The upper series is well below the smoke-hole, and the lower is just above the ground painting, which seems to extend four or five feet up the side of the lodge. It looks as if the complete upper series of crosses runs entirely about the lodge, and the lower series also, except where interrupted by the door.

Still more to the point is the fact that on some prehistoric Hopi or Moki pottery collected by Dr J. Walter Fewkes, and now deposited in the National Museum, appears a figure identical with the Blackfoot sign for the butterfly, and in close juxtaposition to it the unmistakable figure of a noctuid moth. It will be interesting to learn whether this belief in the butterfly as the god of sleep and this same sign for it have any general currency among the western Indians.

The use among the Dakota of the Latin cross to denote the dragonfly as a warner of the approach of danger, is interesting in this connection.

The Piegan Blackfeet call the spider "underground deer" (*ásh' á wá kós*), no doubt because of its rapid movements and the readiness with which it disappears from sight when disturbed. Its activity and supposed intelligence cause the Indians to hold it in high esteem. In ancient times there were religious beliefs and a ceremony about the spider, and though much of this has been forgotten, the animal still possesses a more or less sacred character among these people, so that even today in the ceremony of the medicine-lodge, the medicine-lodge women pray briefly to the spider and ask help from its intelligence.

¹ *Smithsonian Report*, 1894, pp. 516, 517, figs. 207, 208.

It is unnecessary to refer to the position which the spider holds in the beliefs of many other tribes. The subject is a familiar one. I may call attention, however, to the fact that among both the Cheyenne and the Arapaho the same word is used to denote "spider" and "white man," and that in both languages this word appears to convey the idea of high intelligence, being almost the equivalent of "wise or intelligent one."

GEORGE BIRD GRINNELL.

Death of a Celebrated Hopi—Kópeli, the Snake chief at the Tusayan pueblo of Walpi, Arizona, died suddenly on January 2, 1899. He was the son of Sálíko, the oldest woman of the Snake clan, which is one of the most influential as well as the most ancient in Tusayan. His father was Súpela, one of the chiefs of the Pátki, or Rain-cloud people, who came to Walpi from southern Arizona about the close of the seventeenth century. As chief of the Snake priests at Walpi in the last five presentations of the Snake dance at that pueblo, Kópeli had come to be one of the best known of all the Hopi Indians. He inherited his badge of office as Snake chief from his uncle, and was the only chief in Tusayan who had a Snake *tiponi*. His predecessor in this duty was Nuwaiwínú, his uncle, who is still living, and who led the Snake priests in a single ceremony, after which it was found necessary for him to retire on account of his infirmities. At the celebration of the Snake dance in 1883, described by Bourke, Nátcíwa, an uncle of Kópeli, was Snake chief. The oldest Snake chief of whom I can get any information was Murpi, a contemporary of Macali, the Antelope chief preceding Wiki. Kópeli was a relative on his mother's side of both these men. At the time of his death Kópeli was not far from 25 years of age; he had a strong, vigorous constitution, was of medium size, with an attractive face and dignified manner that won him many friends both among his own people and the Americans with whom he was brought in contact. He was a thoroughly reliable man, industrious, and self-respecting. Although a conscientious chief of one of the most conservative priesthoods in Walpi, he was a zealous friend of the whites, and supported innovations introduced by them for the good of his people. He believed in the efficacy of the ceremonial rites of his ancestors, and performed his duty as priest without shirking. As Mr Thomas V. Keam, who knows the Walpi people better than any other white man, told the chiefs in council a few days after the Snake chief's death, "Kópeli was the best man of the Mokis." He was a *pac lólomai tdká*, an excellent man, whose heart was good and whose speech was straight. To most Americans who are interested in



KÓPELL, LATE SNAKE CHIEF AT WALPI



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the Hopi, Kópeli was simply the energetic chief, in barbaric attire, who dashed into the Walpi plaza leading his Snake priests in their biennial Snake dance. This is one of the most striking episodes of the ceremony, and its dramatic effect is not equaled in any of the other pueblos. It was through Kópeli's influence that the Snake dance at Walpi was the largest and most striking of these weird ceremonies in the Hopi pueblos. Kópeli welcomed the educational movement, and had two children in the school at Keam's Canyon at the time of his death. He was buried among the rocks at the base of Walpi mesa with simple ceremonies appropriate to a chief of his standing. The accompanying portrait is from a photograph made in the summer of 1898 by Mr A. C. Vroman of Pasadena, California.

J. WALTER FEWKES.

Ohio Ethnology and Archeology—The first number of volume VII of the *Quarterly* of the Ohio Archeological and Historical Society, containing 203 pages, illustrated, is devoted entirely to a memoir on the "Indian tribes of Ohio—historically considered," and a "Report of field work in various portions of Ohio," during 1898, by Mr Warren K. Moorehead. The preliminary paper on the Ohio Indians, which occupies the first 109 pages of the journal, is devoted chiefly to a summary of the Indian history of the state subsequent to 1750. Although necessarily compiled, Mr Moorehead has managed to bring into condensed form the chief events of this important period of the state's history. The principal importance to those already familiar with the history is the localization of events in consonance with modern geographic names. The only criticism, perhaps, is the distinction the author makes (page 15) between the "Chippewas" and "Ojibeways," which are in reality synonymous terms.

Unfortunately, Mr Moorehead, on account of ill health, was compelled to be absent from the state during the entire season, hence was unable to devote personal attention to the field work. Although he found a worthy substitute in the assistant curator, Mr Clarence Loveberry, an industrious and conscientious explorer, it is evident, from what he states in regard to the mounds and other works excavated, that more information would undoubtedly have been given had Mr Moorehead been constantly on the ground. Although no remarkable discoveries were made, the collections were considerable and valuable in making up the data relating to the archeology of Ohio, especially of Scioto valley, where the works examined are situated. The discovery of the remains of wooden vaults, and of layers of bark accompanying burials, forms cumulative evidence that the works of this

particular region are due to one people and belong to the same era. The results also tend to strengthen the belief that the builders of these works were related to the builders of those in Kanawha valley. The additional statistics in regard to the number, character, and distribution of the mounds given in the latter pages are worthy of notice. It is hoped that financial aid to continue this work will be furnished liberally, as these ancient monuments are rapidly being obliterated. It may not be out of place to suggest that it would perhaps be best to confine the work of a season to a more limited district, thus making the explorations more thorough and complete.

CYRUS THOMAS.

Rare Indian Books Found—Within the last year there have come to light three rare books of interest to students of American Indian linguistics. One of these is the anonymous *Primer for the Use of the Mohawk Children* (sq. 24°, 97 pp.), printed by Fleury Mesplet at Montreal in 1781, which hitherto was supposed to be unique, the only copy believed to exist being in the British Museum library. This little volume was formerly the property of Rev. Samuel Kirkland (1741-1808), who for more than forty years was a missionary among the Iroquois; but through a collateral branch of his family it found its way to California, where, about a year ago, it came in possession of Mr P. J. Healy, a book collector of San Francisco. Special interest attaches to the little primer from an historical point of view, as it was doubtless the product of the first printing-press set up at Montreal.

Of no less importance was the discovery, a few months ago, in the library of the late Horatio Hale, of Clinton, Ontario, of a copy of the 175-? reprint of the anonymous *Indiane Primer*, in the Massachusetts dialect, printed at Boston by B. Green in 1720, the only other copy extant being in the Lenox library, New York City. Both the known copies are imperfect, the Lenox copy lacking 38 of the 84 leaves, while from the Hale copy 10 leaves are missing. Neither volume contains the title-page, hence the exact date of this reprint still remains unknown. The original edition was printed in 1720.

The third of the rarer books alluded to is a copy of the whole Eliot Bible of 1685, an elaborate description of which, based on fifty-five copies known to Pilling, appears in the *Bibliography of the Algonquian Languages*. This newly discovered copy has been acquired by Mr William Wallace Tooker, of Sag Harbor, Long Island, and while not perfect, it is as nearly complete as twenty-six of the copies hitherto known. Many marginal notes in Indian, with the names of several Indian owners, make the book of special interest. For sixty-five years

the bible has been stored away in a chest in a garret. Notwithstanding the fact that of this edition of the Eliot Bible more than half a hundred copies exist, it has always been in great demand by bibliophiles, one purchaser having paid the sum of \$950 for his copy.

F. W. HODGE.

Oriental Influences in Mexico—Some time ago Dr Edward Palmer collected for the National Museum a Mexican rain-coat of palm leaf, called in Mexico "*China capote de palma*." The collection of rain-coats in the National Museum numbers about a score of specimens from China, Japan, and Mexico. Lately these rain-coats were laid out for comparison, under the impression that the Mexican style of this garment might be of Chinese origin. The result of the examination confirms the impression, and it is hoped that later the subject may be presented in detail. The word "*china*" is heard frequently in Mexico, applied, as a rule, to unusual or unfamiliar objects by all classes of the population. When it is recalled that the products of the Philippines were for centuries poured through Mexico to Spain, it would be strange if there were not many resulting traces of Eastern influences in Mexico. These influences may be looked for especially in introduced arts and plants. As an example of present conditions, there is a manufactory in the City of Mexico which employs over four hundred Chinese in making small articles, such as souvenirs, to be sold to tourists.

WALTER HOUGH.

Gabriel de Mortillet—The scientists of Europe are mourning the loss of one of their most active collaborators, distinguished alike as an archeologist, zoölogist, and geologist. Gabriel de Mortillet, whose long and industrious career came to an end September 23d, was born at Meilan, Department of Isère, France, in 1820, and was educated at Chambéry; his devotion to scientific pursuits commenced in early life, and he soon became distinguished as a naturalist; but it was as an archeologist that he achieved the most distinguished success. In 1864 he established a monthly magazine, devoted to the development of the primitive history of man, under the title *Matériaux pour l'histoire positive et philosophique de l'homme*, which in 1869 became *Matériaux pour l'histoire primitive et naturelle de l'homme*, under the editorship of MM. Trutat and Cartailhac. In 1890 the journal was united with the *Revue d'Anthropologie* and *Revue d'Ethnographie* and issued under the title *L'Anthropologie*. Mortillet took an important part in the explorations undertaken by Napoleon III. among the remains of the Gallic peoples as an aid to his studies for a Life of Julius Cæsar. These researches led to the establish-

ment of a Gallo-Roman museum, to which Mortillet was attached and to which he devoted his energies until 1885, when he resigned in consequence of his election to the national legislature. He also took an active part in the proceedings of the Association Française pour l'Avancement des Sciences, the Société d'Anthropologie, and many congresses and meetings of anthropologists and archeologists. A memoir of his life, together with a bibliography prepared by his colleague Émile Cartailhac, is published in the September-October (1898) number of *L'Anthropologie*, Paris.

A. S. GATSCHET.

Korean Crossbow and Arrow-tube—The Koreans have a device for shooting short arrows with a bow, the draw of which is too long for the purpose. This device, hitherto undescribed, is called *sai-tong*, "arrow-tube," and consists of a tube of bamboo having a narrow strip removed throughout its length. One end of the tube is fastened to the wrist of the archer, the other end rests on the hand grasping the bow; the arrow is set on the bowstring with the head slanting into the slot, and tube and arrow are drawn back together. On the release of the string the arrow is discharged through the tube, and simultaneously the tube, having been drawn back past its support, falls down. There is a suggestion here as to the origin of the crossbow. The latter weapon is known to the Koreans, who call it *te-bak-sai*. It is a rapid-fire weapon, shooting four or five arrows in succession like the Chinese crossbow. The principal use of the crossbow was in war, although sometimes it was employed by hunters. The arrows were dipped in vegetal poison, the plant from which it was derived not being known to my informant, Mr Kiu Beung Surh.

WALTER HOUGH.

Among the Murray Islanders of Torres straits the only native numerals are *netat* (one) and *neis* (two). Any higher numbers would be described either by reduplication, e.g., *neis netat*, lit. two-one for three; *neis-i-neis*, lit. two-two for four, etc., or by reference to some part of the body. By the latter method a total of thirty-one could be counted. The counting commenced at the little finger of the left hand, thence counting the digits, wrist, elbow, armpit, shoulder, hollow above the clavicle, thorax, and thence in reverse order down the right arm, ending with the little finger of the right hand. This gives twenty-one. The toes are then resorted to, and these give ten more. Beyond this number the term *gaire* (many) would be used; and if it was necessary to be exact, *kupé*, or tallies, would be used.—Hunt in *Four. Anthropol. Inst.*, N. S., vol. 1, p. 13, London, 1898.

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HAWAIIAN GAMES

By STEWART CULIN

INTRODUCTION

The new materials of this paper were collected from four Hawaiian sailors, from Honolulu, named Aka (Kamehameha), Daviese Kahimoku, Welakahao, and Hale Paka (Harry Park), and verified by means of Andrews' *Hawaiian Dictionary*.¹ These have been supplemented by information from other sources² and by a few notes on similar games in other islands,³ the object

¹ Honolulu, 1865.

² Peter Corney, *Voyages in the Northern Pacific* (1813-1818), Honolulu, 1896. William Ellis, *Polynesian Researches*, London, 1853. Charles Wilkes, U. S. N., *Narrative of the U. S. Exploring Expedition during the Years 1833-1842*, Philadelphia, 1845. H. Carrington Bolton, *Some Hawaiian Pastimes* (*Journal of American Folk-lore*, vol. IV, No. 21). W. D. Alexander, *A Brief History of the Hawaiian People*, N. Y., 1871. Wm. T. Brigham, *Preliminary Catalogue of the Bernice Pauahi Bishop Museum*, Honolulu, 1892.

³ Rev. John B. Stair, *Old Samoa, or Floatsam and Jetiam from the Pacific Ocean*, London, 1897. Thomas Williams and James Calvert, *Fiji and the Fijians*, N. Y., 1859. R. Taylor, *Te iho a mau, or New Zealand and its Inhabitants*, London, 1855. Ernest Dieffenbach, *Travels in New Zealand*, London, 1843. R. H. Codrington, *The Melanesians, Studies in their Anthropology and Folk-lore*, Oxford, 1891. In addition the writer desires to acknowledge his indebtedness to that most suggestive paper by Dr E. B. Tylor: "Remarks on the Geographical Distribution of Games," in the *Journal of the Anthropological Institute*, vol. IX, 1879, and to the chapters on "Toys and Games" in Prof. A. C. Haddon's valuable work, *The Study of Man*, 1898.

being to furnish a concise account of the games of Hawaii for comparative purposes.

Many of the ancient games and amusements of the Hawaiians have practically disappeared since the discovery of the islands by Captain Cook in 1778, but the people retain their pleasure-loving characteristics and assemble on their numerous holidays¹ to engage in wrestling, cock-fighting, and other sports. Live pigs, bread-fruit, bananas, and cocoanuts are wagered on these occasions. Alexander² states that the Hawaiians resorted to games chiefly for the purpose of betting, to which they were excessively addicted. Men and women of all ranks were eager to stake every article they possessed on their favorite players, and the games seldom ended without fierce brawls between the different parties. This custom of betting to the utmost extent in all games came in, according to Brigham,³ in the half century preceding the reign of Kamehameha I, coincident with a general decline in the strict observance of religious rites. It was not common to all the islands. Ellis⁴ says that the natives of Tahiti do not appear to have been gamblers, nor to have accompanied any of their sports with betting, but seem to have followed their games simply for amusement.

The writer has included in this survey all amusements except the dance. He will be greatly obliged for additions and corrections.*

¹ The principal holidays at present, according to my informants, are: March 17, birthday of Kamehameha II; June 17, birthday of Kamehameha I; November 16, birthday of Kalakaua; and New Year's day.

² Op. cit., p. 88.

³ *Preliminary Catalogue*, part II, p. 54.

⁴ Op. cit., p. 204.

⁵ I have refrained from expressing any conclusions based on the material here presented. In general the games described may be referred to the continent of Asia or to recent European or American influence. There are several, however, which are more directly analogous to games played by the American Indians. The resemblance of *mai-ha* to the game of *chenket* has already been pointed out (Andrew MacFarland Davis, *Indian Games*, Bulletin of the Essex Institute, Salem, 1885, vol. XVII, p. 126). To this must be added the stone-dice game, or *lu-lu*, which resembles the game played with bone disks by the Micmac and Cheyenne Indians (see *Chess and Playing Cards*,

THE NEW YEAR FESTIVAL

The *Ma-ka-hi-ki*, or New Year festival, in the latter part of the month of *We-le-hu*,¹ was devoted to sports and general gambling. On the 23d day of the moon of *We-le-hu*, the image of Lo-no ma-ku-a,² the *Ma-ka-hi-ki* god, was decorated. This idol, according to Alexander,³ was like a round pole, 12 feet long, and 3 or 4 inches in diameter, with a head carved at one end. A cross-stick, about 6 feet long, was fastened to its neck, at right angles to the pole, to which were attached feather wreaths, and an imitation of a sea-bird, the *ka-u-pu*,⁴ was perched upon it. A long white *kapa*, like a sail, was fastened at the top to the cross-piece, and left loose at the bottom. There was also made a short idol, called *A-ku-a pa-a-ni* (god of sport) and *Ma-ka-wa-hi-ne*, because it was set up at boxing matches and other games. The next night fires were lighted on the shore, all around the island, and the people went to bathe in the sea, warming themselves at the fires.

Report U. S. Nat. Museum, 1896, figs. 14, 25); also the games of *pa-ku* and *ma-a*, which are not unlike games played by the Sioux and other plains tribes. The most striking analogy, however, exists between the guessing game of *pu-ke-ne-ke-ne* and certain Indian games in which a stone or other object is hidden in one of four places. The resemblance here extends even to the use of the stick to strike the supposed place of concealment. A systematic comparison of *pu-ke-ne-ke-ne* with the American games will be given in the writer's paper on *Indian Guessing Games* now in course of preparation.

¹ The ancient Hawaiians divided the year into twelve months of 30 days each. As this gave but 360 days to their year, they added and gave to their god Lono in feasting and festivity the number of days required to complete the sidereal year, which was regulated by the rising of the Pleiades.

² Lo-no was the fourth of the four great gods that were worshiped throughout Polynesia. He had a separate order of priests and temples of a lower grade. Traditions connected with the ancient kings Lonnakawai and Lono-i-ka-makahiki, seem to have been mixed with those belonging to the primeval god Lo-no. Lono-i-ka-makahiki is reputed to have instituted the games which were celebrated during the *Ma-ka-hi-ki* festival. He is said on some account to have become offended with his wife and murdered her; but afterward lamented the act so much as to induce a state of mental derangement. In this state he traveled through all the islands, boxing and wrestling with everyone he met. He subsequently set sail, in a singularly shaped canoe, for Tahiti, or a foreign country. After his departure he was deified by his countrymen, and annual contests of boxing and wrestling were instituted in his honor.

³ Op. cit., p. 59.

⁴ A large black bird, the size of a turkey, found mostly in Nihoa and Kaula.

This was a rite of purification, after which they all put on new *ma-lo* and *pa-u*.

The next morning the festival began, and for four days no work was permitted. Land and sky and sea were tabu to *Lo-no*, and only feasting and games were allowed. The high-priest was blindfolded and remained in seclusion for five days. Meanwhile all the *ko-no-hi-ki* (headmen) on the island had been getting ready the taxes of their respective lands, in anticipation of a visit from the long god who was now making a tour of the islands. The long god was preceded by a man carrying two long rods which he set up in the ground on arriving at the boundary of a land. The land was then under tabu or interdict, and no one could leave it until the tax was fully paid. The taxes were brought to the *a-hu*, and when the tax collector was satisfied, the priest chanted a prayer to *Lo-no*, the crowd joining in the responses, closing with the shout *Au-le e Lo-no!*—when the land became *no-a* or free, and the long idol moved to the next land.

As evening came on, the people assembled from the surrounding country to see the boxing-matches, etc., under the immediate patronage of the short god. For the next two days there were carried on all kinds of sports, such as boxing, wrestling, sliding down hill, throwing the *mai-ka*, foot-racing, etc., attended with general gambling and revelry.

On the fifth day, called *Lo-no*, the bandage was taken from the eyes of the high-priests, and canoes were allowed to go fishing for that day. The tabu was then resumed until the long idol returned, i. e., for about twenty days. On the evening of that day the *Ka-lii* ceremony was performed, as follows:

The king with a numerous company went fishing, taking the long idol with him. On his return, he was accompanied by a warrior, expert in the spear exercise. As the king leaped ashore a man rushed forward with two spears bound with white kapa, and hurled one at him, which was parried, after which he simply touched the king with the other spear, and the

ceremony was over.¹ This was followed by sham fights, until the king put a stop to them and repaired to the *he-i-au* (temple) to pay his devotions to Lo-no.

The next day the long idol was stripped of its ornaments, which were packed up and deposited in the temple for use another year, and a white canoe, called Lo-no's canoe, to return to *Ka-hi-ki* in, was sent to sea, after which all restrictions on fishing and farming were removed (*no-a ka ma-ka-hi-ki*).

GAMES

1. *Ko-wa-li*: JUMPING-ROPE.—The rope may be swung by two persons, by one person with the other end fastened, or by one person who also jumps. Two girls frequently jump together, counting until they miss. Andrews gives *pu-he-o-he-o* as "a sport of children like jumping the rope." *Ko-wa-li*, the term given by my informants, is the name of the convolvulus, the vine of which is used as a rope.

Taylor² describes the skipping rope of New Zealand under the name *he piu*. Two persons generally hold the rope, and a third skips over it; sometimes they tie an end of the rope to a post and one twirls the rope while several jump over at the same time. It is also used by one person as with us.

2. *Le-le-ko-a-li*: SWINGING.—A single rope is used, to which a stick is attached, across which one person sits, while another sits facing him astride his legs. The swingers are pulled by ropes from the opposite side. The name is from *le-le*, "to fly," and *ko-a-li*, the convolvulus, the vine formerly used for swings.

Ellis³ says of the Tahitians that they were very fond of the *tahoro*, or swing, and frequently suspended a rope from a branch of a lofty tree, and spent hours in swinging backward and forward. They used the rope singly, and at the lower end fastened a short stick.

¹ Alexander states that Kamehameha always caught the spear himself.

² Op. cit., p. 173.

³ Op. cit., I, p. 223.

Williams¹ describes the Fijian swing as supplying a favorite amusement to children and young people. It consists of a single cord, either a rope or strong vine, suspended from a tree and having at its lower end a loop in which to insert one foot as in a stirrup, or a knot on which both feet rest. Grasping at a convenient height the cord, which varies in length from 30 to 50 feet, the swinger is set in motion and rejoices to dart through the air, describing an arc that would terrify a European.

Tregear² describes a New Zealand swing, *morere* or *moari*, consisting of a pole with ropes at the top held by runners, the "giant's stride," sometimes played on the edge of cliffs, half the swing being over the abyss.

Taylor,³ under *he morere, he moari*, says: "This is a lofty pole, generally erected near a river, from the top of which about a dozen ropes are attached; the parties who use it take hold of them, and swing round, going over the precipice, and, whilst doing so, sometimes let go, falling into the water. Occasionally serious accidents have thus occurred by striking the bank."

3. *Ma-hi-ki*: SEE-SAW.—This is commonly played by girls, who sit astride a board. Two or three sit on each side with two boys standing back to back in the middle.

Wilkes⁴ says:

"They had likewise the amusement of see-saw, which has not yet gone out of fashion, and is performed in a manner somewhat different from ours. A forked post is placed in the ground; on this a long pole is placed, which admits several on each side. After two or three ups and downs, they try which shall give the opposite party a tumble. This is, at times, adroitly done, and down they all fall, to the infinite amusement both of their adversaries and the bystanders, who indulge in loud laughter and merriment at the expense of those who are so unlucky as to get hurt."

4. *Ho-lo-ti-s*: "HORSE-RIDING."—Boys play "horse," riding astride a stick.

¹ Op. cit., p. 137.

² Page 115.

³ Page 173.

⁴ Vol. IV, p. 47.

5. *Ku-ala-poo*: "HEAD-STANDING."—Turning somersaults is a common pastime of boys.

6. *Pe-le-pe-le*: BOXING.—Boxing gloves are now used, but formerly the hands were wrapped with kapa, tied at the wrist. Captain King,¹ in his journal of Cook's voyage, describes boxing among the Hawaiians as follows:

"We found a vast concourse of people assembled on a level spot of ground at a little distance from our tents. A long space was left vacant in the midst of them, at the upper end of which sat the judges, under three standards, from which hung slips of cloth of various colors, the skins of two wild geese, a few small birds, and bunches of feathers. When the sports were ready to begin, the signal was given by the judges and immediately two combatants appeared. They came forward slowly, lifting their feet very high behind, and drawing their hands along the soles. As they approached, they frequently eyed each other from head to foot in a contemptuous manner, casting several arch looks at the spectators, straining their muscles, and using a variety of affected gestures. Being advanced within reach of each other, they stood with both arms held out straight before their faces, at which part all their blows were aimed. They struck, in what appeared to our eyes an awkward manner, with a full swing of the arm; made no attempt to parry, but eluded their adversary's attack by an inclination of the body, or by retreating. The battle was quickly decided, for if either of them was knocked down, or even fell by accident, he was considered vanquished."

Ellis says that in Tahiti, "on all great festivals, wrestling was succeeded by the *moto-raa* or boxing. It was mostly practiced by the lower orders and servants of the Arcois, and was with them, as boxing is everywhere, savage work. The challenge was given in the same way as in wrestling. The blows were generally straight-forward, severe, and heavy; usually aimed at the head. They fought with the naked fist, and the whole skin of the forehead has been at times torn or driven off at a blow."

Captain Cook² states that the method of boxing in the Marque-

¹ *A Voyage to the Pacific Ocean*, 2d ed., London, 1784, vol. III, p. 22.

² Vol. III, p. 244.

sas differed very little from that practiced in England, but speaks of seeing boxing matches between women in the presence of at least three thousand people.

7. *Ka-ka-pa-hi*: FENCING.—Fencing is practiced on holidays with wooden swords. The name is derived from *ka-ka*, "to strike," and *pa-hi*, "knife," "sword."

8. *Ku-la-ku-lai*: WRESTLING.—The contestants wear only breechcloths. They each put one arm around the other's neck and the other around his waist. People bet on the contest. Andrews gives *ka-hu-a mo-ko-mo-ko* as "a place where people assemble to wrestle."

In Tahiti, according to Ellis,¹ wrestling, *maona*, was the favorite sport at the *taupiti*, or public assemblies, festivals usually connected with some religious ceremony or cause of national rejoicing. The wrestlers of one district sometimes challenged those of another, but the conquest often took place between the inhabitants of different islands. In this, as in most of their public proceedings, the gods presided. Before wrestling commenced, each party repaired to the *marae* of the idols of which they were the devotees. Here they presented a young plantain tree, which was frequently a substitute for a more valuable offering, and having invoked aid of the tutelar deity of the game, they repaired to the spot where the multitude had assembled. A space covered with grassy turf, or the level sand of the sea-beach, was usually selected for these exhibitions. Here a ring was formed, perhaps thirty feet in diameter. The inner rank sat down, the others stood behind them; each party had their instruments of music with them, but all remained quiet until the games began. Six or ten, perhaps, from each side, entered the ring at once, wearing nothing but the *maro*, or girdle, and having their limbs sometimes anointed with oil. Challenges were sent previous to the arrival of celebrated wrestlers, but if no such arrangement had been made, the wrestlers of one party or perhaps their champion walked

¹ Vol. 1, p. 204.

around and across the ring, having the left arm bent, with the hand on the breast, and gave the challenge by striking the right hand violently against the left, and the left against the side, which produced a loud, hollow sound. Several were sometimes engaged at once, but more frequently only two. They grasped each other by the shoulders. Unbroken silence and deep attention were manifested during the struggle; but as soon as one was thrown, the drums of the victor's friends struck up, the women rose and danced in triumph over the fallen wrestler and sang in defiance to the opposite party. The latter immediately commenced a most deafening noise, principally to mar and neutralize the triumph of the victors. When the wrestlers engaged again, the clamor ceased. The victor either withdrew, which was considered honorable, or remained and awaited a fresh challenge. When the contest was over, the men repaired again to the temple and presented their offering of acknowledgment, usually young plantain trees, to the idols of the game.

Captain Cook¹ speaks of wrestling being performed in the Marquesas in the same manner as at Tahiti.

Taylor² says that in New Zealand *te takaro ringaringa*, or wrestling, was a very general amusement of young men, who prided themselves on their skill in throwing one another, as much, perhaps, as our own countrymen have ever done. Tregear³ speaks of it as played with any hold.

J. Stanley Gardiner⁴ says that in Rotuma "in wrestling any fall to the ground counted. The chosen champions watched each other carefully from a distance, and then, perhaps, one would rush on the other and make a feint, only to turn aside when they seemed bound to come to close quarters. The great idea was to get one's opponent, from the nature of his or your rush, into an awkward position, so that he could be seized around one thigh, and could not avoid a fall."

¹ Vol. III, p. 244.

² Page 115.

³ Page 173.

⁴ *Journal Anthropological Institute*, vol. XXVII, p. 486.

9. *U-ma*: WRIST- OR ARM-WRESTLING.—The two contestants grasp hands, their elbows resting upon the ground, and each endeavors to press the other's arm over. This is known in Japan as *hisi-sumo*, "elbow-wrestling," or *ude-sumo*, "arm-wrestling." Prof. Edward S. Morse informs me that wrist-wrestling is practiced also by Spaniards and Cubans, each contestant putting his elbow on a piece of money from which he may not remove it.

10. *U-lu-mi i-lo-ko o-ke kai*: "WRESTLING IN THE SEA."—One man tries to "duck" another and reach shore before the ducked one can catch him. The winner receives the stake of roast pig, cocoanuts, or whatever it may be.

11. *Hu-ki-hu-ki-kau-la*: "ROPE-PULLING," TUG-OF-WAR.—The teams consist of seven men on each side, each with a captain. A piece of kapa is tied to the middle of the rope and it is required to pull it a certain distance to one side or the other in order to win. It is played for money prizes.

Stair¹ says that in Samoa "pulling, or trial of strength, was similar to the English tug-of-war, in which each side endeavored to get possession of a pole held between them."

12. *Hu-ki-hu-ki-a-i*: "NECK-PULLING."—Each of two persons puts a loop around his neck and pulls, endeavoring to pull the other over. The contest is engaged in for small prizes. It is known in Japan by the name *kubi hiki*.

13. *Hu-ki-hu-ki-li-ma*: "FINGER-PULLING."—Two persons lock forefingers and each endeavors to pull the other's finger straight out.

14. *Hei-hei-ku-ki-ni*: "FOOT-RACING."—A dozen or more men will race for a prize, a favorite holiday amusement, the stake being a pig, cocoanuts, or bread-fruit. The course is usually one-half to three-quarters of a mile. The starting point is called *pa-hu-ku*, and the goal *pa-hu-ho-pu*. The runners, *ku-ki-ni*, are entirely naked except for a breechclout. *Ku-ki-ni* means "runner." The *ku-ki-ni* was formerly a government officer, whose duty it was to

¹ Op. cit., p. 336.

carry orders to different parts of the island, and such were held in estimation according to their fleetness.¹ In his journal of Cook's voyage to the Pacific ocean,² Captain King, speaking of the Hawaiians, says: "They frequently amuse themselves with racing matches between the boys and girls; and here again they wager with great spirit."

Ellis³ describes the foot-race of Tahiti under the name of *faatititaihe-mo raa*:

"Young men of the opposite parties engaged. Great preparations were made for this trial of strength and agility. The bodies of the runners were anointed with oil; the *maro*, or girdle, their only garment, was bound tight round the loins. A wreath of flowers adorned the brows, and a light white or colored bandage of native cloth was sometimes bound like a turban round the head. A smooth line of sandy beach was usually selected for the course. Sometimes they returned to the place from which they started, but in general they ran the prescribed distance in a straight line."

15. *Hei-hei-haa-we*: "BURDEN-RACING."—This is a contest in which each of the participants carries another astride his neck.

16. *Hei-hei-e-ke*: "SACK-RACING."—Eight men usually race, starting from a line, running to a goal and back to the line.

17. *Le-le-wa-wae-ka-hi*: "ONE-FOOT JUMPING," HOPPING.—Contestants tie one leg and run races, hopping on one foot.

18. *Le-le-le-la-au*: "STICK-JUMPING," VAULTING.—Vaulting is practiced with the aid of a long pole.

19. *Hei-hei-hu-i-la-ba-la-la*: "WHEELBARROW RACING."—This is a sport of recent introduction.

20. *Hei-hei-au*: "SWIMMING RACE."—Men and boys play, either in fun or for a prize of food or money.

21. *Hei-hei-waa*: "CANOE-RACING."—Two or more canoes race, usually out to sea, the course being a mile or a mile and a half out and around a flag buoy and return. The canoes are propelled with kapa sails.

¹ Andrews, *Hawaiian Dictionary*.

² Vol. III, p. 145.

³ Vol. I, p. 210

Ellis¹ speaks of Tahiti canoe-racing, *faatitiaihe-mo raa vaa*, as "occasionally practiced on the smooth waters of the ocean, within the reefs." J. Stanley Gardiner² relates that in Rotuma—

"canoe-sailing was carried on, especially on the occasions of certain big feasts in connection with the *son*. The canoes employed were the small ones, the *tuvane*, with mat sails. In each canoe only one man sailed, and the different districts would contest the prize with ten, twenty, or even more representatives. There were also commonly canoe-races for the women. The course was always inside the reef, and much fun was caused by the constant capsizing of the canoes."

22. *Hei-hei-ka-pu*: "TUB-RACING."—Tubs for racing are made out of casks cut in halves, and propelled with the hands. Andrews gives *ka-pu-wai*, from *ka-pu*, "place," and *wai*, "water," a bathing tub.

23. *Hei-hei-na-lu*: "SURF-RACING."—The surf-board, *pa-pa-hee-na-lu*, is made from the wood of the *wi-li-wi-li* (*Erythrina corallodendrum*) or bread-fruit tree. Ellis³ describes it as generally five or six feet long, and rather more than a foot wide, sometimes flat, but more frequently slightly convex on both sides. It is usually made of the wood of the *Erythrina*, stained quite black and preserved with great care. After using, it is placed in the sun until perfectly dry, when it is rubbed over with cocoanut oil, frequently wrapped in cloth, and suspended in some part of the dwelling. Dr Bolton⁴ describes the play as follows:

"Plunging through the nearer surf, the natives reached the outer line of breakers, and watching their opportunity they lay flat upon the board (the more expert kneeled), and just as a high billow was about to break over them, pushed landward in front of the combers. The waves rushing in were apparently always on the point of submerging the rider, but, unless some mishap occurred, they drove him forward with rapidity on to the beach or into shallow water."

¹ Vol. 1, p. 210.

² *Journal Anthropological Institute*, vol. XXVII, p. 486.

³ Vol. IV, p. 369.

⁴ *Journal of American Folk-lore*, vol. IV, p. 21.

Racing in the surf is called *hei-hei-na-lu*, from *hei-hei*, "to race," and *na-lu*, "surf." Two champions will swim out to sea on boards and the one first arriving on shore wins.

Playing in the surf is *hee-na-lu*, from *hee*, "to glide." Andrews gives the names *o-lo* and *o-wi-li* for "a very thick surf-board made

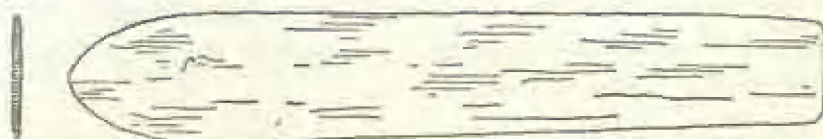


FIG. 4.—Surf-board of hard, blackened wood; length, 71 inches. British Museum. (From *Ethnographic Album of the Pacific Islands*, II, 33, No. 13)

of *wi-li-wi-li*," and *o-ni-ni* as "a kind of surf-board"; also *pa-ha* as "a name for surf-board," and *ki-o-e*, the "name of a small surf-board."

According to Brigham¹—

"Surf-boards were usually made of *ko-a*, flat with slightly convex surface, rounded at one end, slightly narrowing towards the stern, where it was cut square. Sometimes the *pa-pa* were made of very light *wi-li-wi-li* and then were narrow, *o-lo*. In size they varied from 3 to 18 feet in length and from 8 to 10 inches in breadth, but some of the ancient boards are said to have been 4 fathoms long. The largest in this museum are so heavy that they require two men to move them. The surf riders swam out to sea to the *ku-la-na* or place where the high rollers follow each other in quick succession, and there mounted a high wave and rode on it until near the beach where the water was smoother; the first one arriving at the *hu-a* won the race. The riders sometimes raced also to the *ku-la-na* or starting place. Standing on the boards as they shot in was by no means uncommon. Men and women both took part in this delightful pastime which is now almost a lost art."

Wilkes² says: "The Kingsmill islanders use a small board in swimming in the surf like that used by the Sandwich islanders." According to Codrington,³ "in the Banks' islands and Torres islands, and no doubt in other groups, they use the surf board, *tapa*."

¹ *Preliminary Catalogue*, part II, p. 55.

² *Op. cit.*, p. 341.

³ *Op. cit.*, vol. V, p. 100.

24. *Le-le-ka-wa*: "PRECIPICE-JUMPING."—Leaping from lofty cliffs into the sea is a favorite pastime. The feat is performed as a game, the first one reaching the goal being regarded as the winner. The name is from *ka-wa*, "a precipice," and *le-le*, "to jump."

25. *O-i-li-pu-le-lo*.—A former sport of the chiefs was to send lighted firebrands down a *pa-li*, or precipice, at night. It is thus described by an eye-witness¹:

"On dark, moonless nights from certain points of these precipices, —where a stone would drop sheer into the sea,—the operator takes his stand with a supply of *pa-pa-la* sticks (a light and porous indigenous wood), and, igniting one, launches it into space. The buoyancy of the wood and the action of the wind sweeping up the face of the cliffs, cause the burning branch to float in mid-air, rising or falling according to the force of the wind, sometimes darting far seaward, and again drifting towards the land. Firebrand follows firebrand, until, to the spectators who enjoy the scene in canoes upon the ocean hundreds of feet below, the heavens appear ablaze with great shooting stars, rising and falling, crossing and recrossing each other in a weird manner. So the display continues until the firebrands are consumed, or a lull in the wind permits them to descend slowly and gracefully into the sea."

The *papala* tree (*Charpentiera ovata*) attains the height of about twenty feet and grows only upon the highlands from two to three thousand feet above the sea.

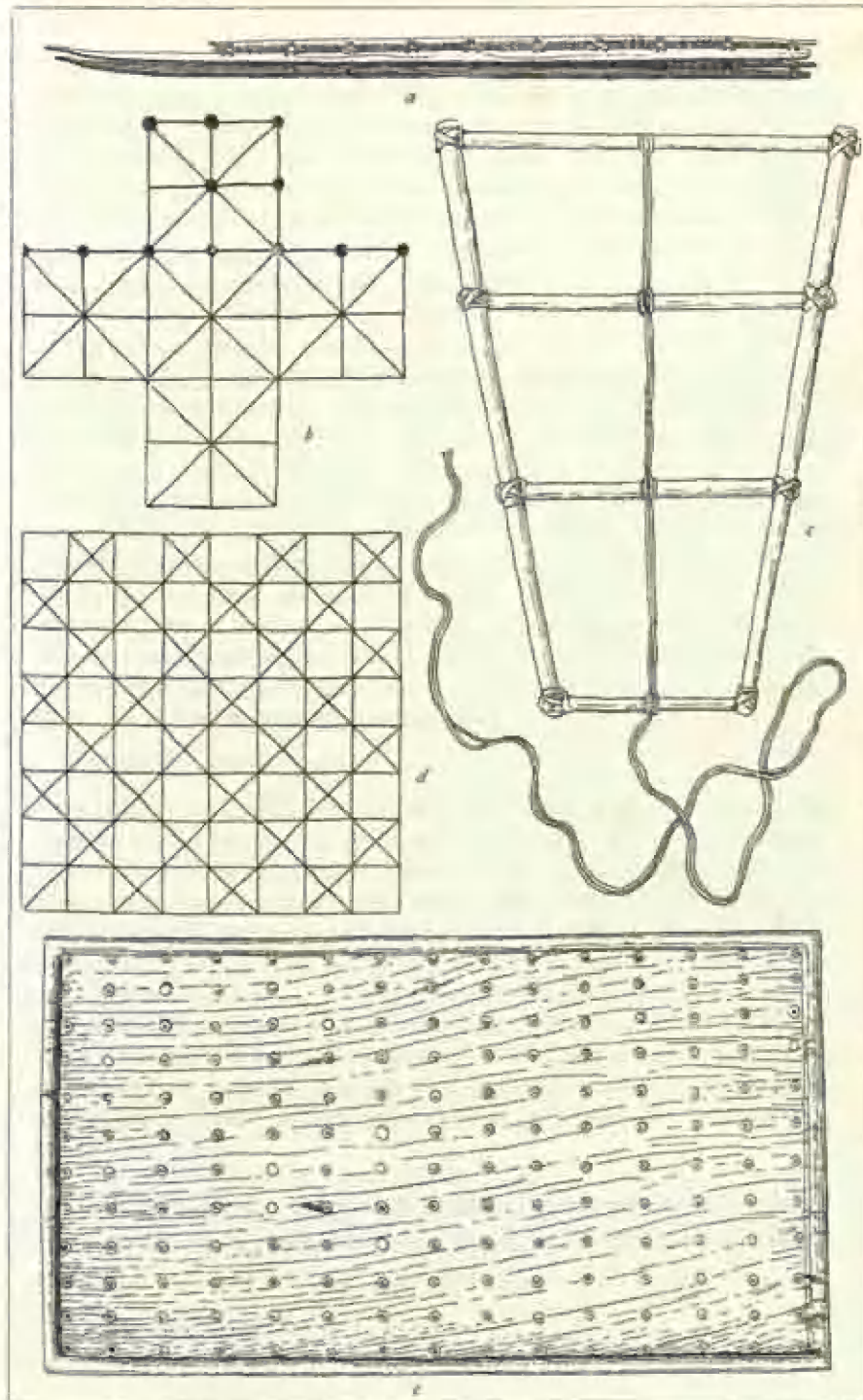
26. *Hee-ho-lu-a*: "SLEDGE-SLIDING."—Two persons, stretched at full length, slide together head-first down hill on a smooth board (*ho-lu-a*). Several often compete, the one down first winning a prize. My informants state that the game is no longer practiced.

Of this pastime Ellis² says:

"The *ho-lu-a* has for many generations been a popular amusement throughout the Sandwich Islands, and is still practiced in several places. The *pa-pa* or sledge is composed of two narrow runners, from

¹ Mrs. Francis Sinclair, Jr., *Indigenous Flowers of the Hawaiian Islands*, London, 1885. Quoted from Dr. Bolton.

² Vol. IV, p. 299.



HAWAIIAN GAMES

a, *Papa ka-lua*—Sledge for hill-sliding (No. 320, Bishop Museum); b, Board for *ma-na*; c, *Pu-ma-a-ka*—Canoe puzzle (No. 21,445, Museum of Archeology, University of Pennsylvania); d, Board for *ma-na*, draughts; e, Board for *ka-na-ne* (No. 867, Bishop Museum).

7 to 12 or 18 feet long, two or three inches deep, highly polished, and at the foremost end tapering off from the under side to a point at the upper edge. There two runners are fastened together by a number of short pieces of wood laid horizontally across. To the upper edge of these short pieces two long, tough sticks are fastened, extending the whole length of the cross-pieces and about 5 or 6 inches apart. Sometimes a narrow piece of matting is fastened over the whole upper surface, except three or four feet at the foremost end, though in general only a small part for the breast to rest on is covered. At the foremost end there is a space of about two inches between the runners, but they widen gradually towards the hinder part, where they are distant from each other 4 or 5 inches. The person about to slide grasps the small side-stick firmly with his right hand, somewhere about the middle, runs a few yards to the brow of the hill, or starting place, where he grasps it with his left hand, and at the same time, with all his strength throwing himself forward, falls flat upon it, and slides down the hill, his hands retaining their hold of the side-sticks, and his feet being fixed against the hindmost cross-piece of the sledge. Much practice and address are necessary, to assume and keep an even balance on so narrow a vehicle, yet a man accustomed to the sport will throw himself with velocity and apparent ease a hundred and fifty or two hundred yards down the side of a gradually sloping hill."

Brigham¹ states that:—

"the *ho-lu-a*, or track, was built with great care on a hill-side, and the remains of one are plainly seen on the hill, *mau-ka*, of the Museum. Constructed of stone when a hollow in the track needed filling, the *ho-lu-a* was covered with earth well beaten down, and dry grass was spread over all, and a very slippery surface resulted. The sled, *pa-pa ho-lu-a*, was made of *ma-ma-me* (*Erythrina crysophylla*) or of *u-hi-u-hi* (*Cesalpinia kauaiensis*). Two long runners resembling skate irons were bound firmly to the upper stage 2½ inches apart from the centers, the whole sled being some 11½ feet long. This *pa-pa* was carefully oiled with *ku-kui* oil, and the rider ran with the sled to gather impulse, and then threw himself headlong down the course. This was an eminently aristocratic game."

Two sledges are preserved in the Bishop Museum; one of which (plate XI, *a*) is said to have belonged to the hero Lonoikamakahiki. The other (Cat. No. 321) consists of the runners only.

¹ *Preliminary Catalogue*, part II. p. 56.

It is related that the goddess Pele enjoyed this game and frequently engaged in it. Ellis¹ relates the story of the contest of the goddess with Kahavari, chief of Puna, in which she drove him from the island by a stream of lava.

27. *Ku-ku-lu-a-e-o*: STILTS.—Walking or racing on stilts is a common amusement of men, boys, and girls. Andrews mentions *o-ke* as timber suitable for making stilts, and gives *ha-ka-ke*, "to stand on stilts."

In the Marquesas islands stilts were used, the foot-rests of which were highly carved. These rests were lashed to poles six feet in length which also were carved. Examples of the rests in the Museum of the University of Pennsylvania (Cat. No. 18,016) are carved, as is usual, with human figures. Brigham² reports specimens in many European collections, and in the Musée de Marine in the Louvre, a pair attached to poles for use. Another pair of carved bamboo stilts in the Christy collection, designated as "dancing stilts," are figured by Ratzel.³

Ellis⁴ says that in Tahiti walking on stilts was a favorite amusement with the youth of both sexes. The stilts were formed by nature and generally consisted of the straight branches of a tree, with a smaller branch projecting on one side. The bare feet were placed on this short branch, and thus, elevated about three feet from the ground, they pursued their pastime. Stilt-walking in New Zealand is mentioned by Taylor⁵ under the name of *pouturu*, and Tregear⁶ adds *araporaka*.

28. *Pai-pai-li-ma*: HAND-CLAPPING.—Two persons stand opposite each other and clap their hands in the same manner as played by children in the United States. The movements are as follows: (1) both clap hands, (2) clap left hands, (3) clap hands, (4) clap right hands, (5) clap hands, (6) clap each other's hands, and then repeat. This is described as a girls' game. They sing, keeping time to the play.

¹ Vol. IV, p. 300.

² *Director's Report, Bishop Museum, Honolulu, 1898.*

³ *History of Mankind*, vol. I, p. 193, London, 1896.

⁴ Vol. I, p. 328.

⁵ *Op. cit.*, p. 174.

⁶ *Op. cit.*, p. 116.

29. *Ku-hi-ku-hi-ma-ka*: "EYE-POINTING."—Two or more persons play. One leads by pointing repeatedly with his finger to his nose, crying "Nose! Nose! Nose!" All the others must then point in the same manner, each with his finger to his eye. The leader changes to his eye, whereupon each of the others must point to his ear. He points to his ear, and they point to the mouth; to the mouth, and they point to the top of the head; to the top of the head, and they clap their hands; the leader then claps his hands and the others point to the breast; finally he points to his breast and they all run and the game comes to a close.

30. *Ku-hi-la-au*: "WOOD-POINTING."—This game is like the preceding. The leader points to the top of a stick or a piece of wood, crying *Ma-lu-na! Ma-lu-na!* ("Above! Above!"); the others must then point to the middle. He then points to the middle, crying *I-wae-na! I-wae-na!* ("Between! Between!"), and the others must point to the bottom. He points to the bottom, crying *Ma-la-lo! Ma-la-lo!* ("Below! Below!"), whereupon the others must point to the side. The leader points to the side, crying *Ao-ao! Ao-ao!* ("Side! Side!"), when the others point to the top again.

31. *O-lo-lo*: "RUBBING."—The feat of rubbing one thigh with the right hand and patting the other with the left hand.

32. *Hu-i-la-ma-ka-ni*.—The feat of describing opposing circles with the hands and arms.

33. *O-le-ha*.—An amusement consisting in placing a stick, about two inches long, between the eyelids to prop them open. The name means, primarily, to set or fix the eyes.

Ellis¹ says that in Tahiti "the *teatea mata* was a singular play among the children, who stretched open their eyelids by fixing a piece of straw, or stiff grass, perpendicularly across the eye, so as to force open the lids in a most frightful manner."

34. *Ha-ka mo-a*: "COCK-FIGHTING."—Cocks (*mo-a ka-ne, mo-a*

¹ Op. cit., vol. 1, p. 225.

ka-ka-la) are fought on holidays in the public squares, bets of pigs, chickens, cocoanuts, etc., being wagered on the contests. The battles are to the death. The combs are not trimmed, but the spurs are cut off and the cocks fight with their beaks. A good fighting cock costs five dollars. The name is from *ha-ka*, "to fight," and *mo-a*, "a fowl." A drawn game is called *pai-wa-le*, and the assembly at a cockfight, *a-ha-mo-a*.

Ellis¹ states that cock-fighting (*faatito raamoa*; literally, causing fighting among fowls) was the most ancient game among the Tahitians. He remarks:

"The traditions of the people state that fowls have existed in the islands as long as the people, that they came with the first colonists, or that they were made by Taaroa at the same time that men were made. The traditions and songs of the islanders connected with their amusements are as ancient as any in existence among them. They do not appear to have laid bets on their favorite birds, but to have trained and fought them for amusement. The fowls designed for fighting were fed with great care; a finely carved *fatapua*, or stand, was made as a perch for the birds. This was planted in the house, and the bird fastened to it by a piece of cinet, braided flat, that it might not injure the leg. No other substance would have been secure against the attacks of his beak. Their food was chiefly *poe*, or bruised bread-fruit, rolled up in the hand like paste, and given in small pieces. The fowl was taught to open his mouth to receive his food and his water, which was poured from his master's hand. It was also customary to sprinkle water over these birds to refresh them. The natives were universally addicted to this sport. The inhabitants of one district often matched their birds against those of another, or those of one division of a district against those of another. They do not appear to have entertained any predilection for particular color in the fowls, but seem to have esteemed all alike. They never trimmed any of the feathers, but were proud to see them with heavy wings, full-feathered necks, and long tails. They also accustomed them to fight without artificial spurs or other means of injury. In order that the birds might be as fresh as possible, they fought them early in the morning, soon after day-break, while the air was cool, and before they became languid from heat. More than two were seldom engaged at once, and as soon as

¹ Op. cit., vol. I, p. 221.

one bird avoided the other, he was considered as *iti*, or beaten. Victory was declared in favor of his opponent, and they were immediately parted. This amusement was sometimes continued for several days successively, and, as well as the other recreations, was patronized by their idols. Ruaifaatoa, the god of cock-fighters, appears among the earliest of their inferior divinities."

J. Stanley Gardiner¹ says of Rotuma: "The chiefs used to breed a small cock, somewhat similar to the Malayan fowl; great care was taken in the feeding, and the spur was especially sharpened and oiled. Usually pigs were put up on both sides, and went to the conquerors."

35. *Ho-pu-ho-pu-na-lo*: "DRAGONFLY-CATCHING."—Children catch dragonflies, *pi-nau*, in a net, crying out the number, one, two, three, four, and so on, as they catch them. The one who first gets ten wins. All then stop, and putting the dragonflies in their handkerchiefs, count "one, two, three," and release them.

36. *Le-le-pi-nau*: "DRAGONFLY-FLYING."—Children catch dragonflies and tie them to a string to see which can fly farthest.

37. *Au-waa-lau-ki*: "LEAF-CANOES."—Children fold up *ki* (*Dracena terminalis*) leaves and sail them (Andrews). The name is derived from *au-waa*, a fleet, and *lau-ki*, the leaf of the *ki* plant.

Ellis² describes Tahitian children constructing small canoes, boats, or ships, and floating them in the sea. "Although they are rude in appearance," he says, "and soon destroyed, many of the boys display uncommon ingenuity in constructing this kind of toy. The hull is usually made with a piece of light wood of the hibiscus, the cordage of bark, and the sails either of the leaflets of the cocoanut, or the native cloth. They usually fix a stone to the bottom of the little barks, which keeps them upright."

38. *Kii-pe-pe*: "DOLLS."—Little girls make dolls out of stones which they wrap in banana leaves.

39. *Pe-pa pa-a-ni*: "PAPER PLAY."—Children fold paper (*pe-*

¹ *Journal Anthropological Institute*, vol. XXVII, p. 486.

² Vol. I, p. 227.

pa) or kapa into a variety of shapes, as a bird, *ma-nu* (see figure 5), which glides down like a bird in the air. Other forms are a box (*po-ho-kui-i*) for pins and needles, and neckties (*lei-a-i*). They also weave strips of kapa into mats, *mo-i-na*, and braid.

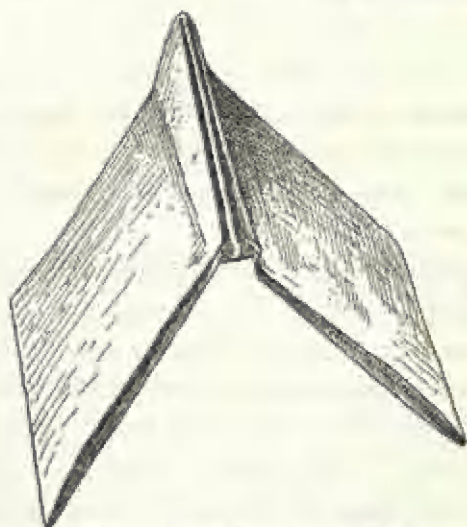


FIG. 5.—*Peleha ma-nu*, paper bird (No. 41,499, Museum of Archeology, University of Pennsylvania).

40. *Po-ka-kaa*: BUZZ.—The buzz is made of a disk of bark (said to be of the *hau*) perforated with two holes through which a cord is passed. The name means "wheel." Tregear¹ mentions *porotiti*, a New Zealand boy's game of "twirling a disk."

41. *O-e-o-e*: BULLROARER.—This is made of wood, with a hole in one end through which is passed a cord with which it is whirled. It is known to my informants as a toy. They gave as another name, *ko-wa-li-wa-li*. Andrews gives *ko-he-o-he-o* as "an instrument to assist in mourning or wailing along with other sounds."

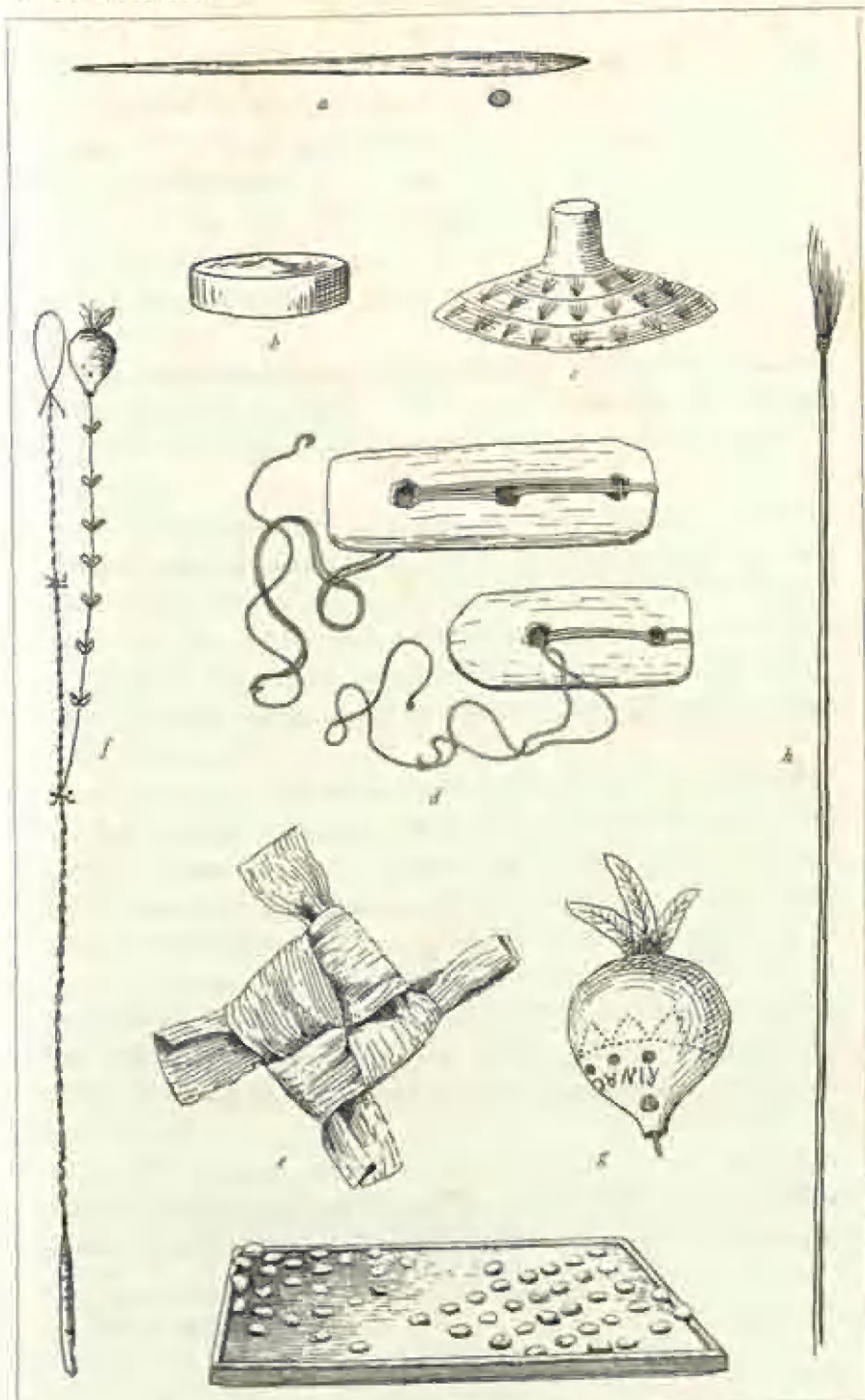
Codrington² describes the use of the bullroarer, under the name of *buro*, in the Mysteries at Florida, and says it is there only that any superstitious character belongs to it. There is no

¹ Op. cit., p. 115.

² Op. cit., p. 342.

EXPLANATION OF PLATE XII

- a. *I-hi-pa-hee*—Club for game; length, 41 inches. British Museum. (From *Ethnographic Album of the Pacific Islands*, 1, 56, No. 1.)
- b. *U-lu-mai-ka*; diameter, $3\frac{1}{2}$ inches. British Museum. (From *Ethnographic Album of the Pacific Islands*, 1, 55, No. 15.)
- c. *Ki-lu*; diameter, $3\frac{1}{2}$ inches. British Museum. (From *Ethnographic Album of the Pacific Islands*, 1, 60, No. 14.)
- d. *Pu-la-aw*—Wood-puzzles. No. 21,446, Museum of Archeology, University of Pennsylvania.
- e. *Hu-i-la-mo-ka-né*—Pin-wheel. No. 21,504, Museum of Archeology, University of Pennsylvania.
- f. Cup and ball. (From *Ethnographic Album of the Pacific Islands*, II, 35, No. 1.)
- g. Detail of f.
- h. *Ma-i-le*—Highly polished red-wood rod, with tuft of hair fastened at end; used in *pu-ke-ne-ke-ne*; length, 36 inches. British Museum. (From *Ethnographic Album of the Pacific Islands*, 1, 33, No. 1.)
- i. Board and men for *ko-na-ne*. No. 866, Bishop Museum. (After a photograph.)



HAWAIIAN GAMES

mystery about it when it is used in the Banks' islands to drive away a ghost, as in Mota, where it is called *nanamatea*, "death maker," or "to make a mourning sound," and as in Merlav, where it is called *wo-rung-lamb*, "a wailer," and is used the night after a death. It is a common plaything. In Vanua Lava they call it *mala*, "pig," from the noise it makes; in Maewo it is *tal-viv*, a "whirring string"; in Araga it is merely *tavire bua*, a "bit of bamboo."

42. *Hu-i-la-ma-ka-ni*: "WIND-WHEEL," PIN-WHEEL.—A toy made of paper or kapa. The paper pin-wheel is identical with that of Europe, but that of kapa has the form shown in plate XII, *e*.

B. T. Sommerville¹ says that in New Georgia, Solomon islands, "toys of pieces of cocoanut fronds are made for children. Three of these are a 'whirligig,' a 'whistler,' and a 'frigate-bird.' The first is a little windmill, which revolves when presented to the wind; the second, an arrangement of cocoanut leaf which, when violently swung round in the air, gives a sound of a large locust humming."

43. *Hu-o-o-o-e*: HUMMING TOPS.—Humming tops are made of small gourds. Andrews gives *o-ka*, "a top made of a small gourd"; *o-kan*, "a top," "to spin like a top"; *u-i-i-i*, "a small gourd used for a top to play with"; and *o-ni-u*, "a top for spinning, a plaything for children, generally made of a cocoanut."

44. *Hu-ko-a*: WOODEN TOPS.—Wooden or peg tops are so called from *hu*, top, and *ko-a* (*Acacia koa*), the wood of which they are made. They have iron points. A top is put in the middle of a ring on the ground and the object of the game is to knock it out.

In New Zealand, according to Taylor,² *he poro*, *he potaka*, *he kaihora*, *he kaihotaka*, the whipping top, is another game which is played in every part of the island; the top used is more of a

¹ *Journal Anthropological Institute*, vol. XXVI, p. 409.

² *Op. cit.*, p. 172.

cone, and of less diameter than our English one, but in other respects is just the same.

Dieffenbach¹ also says that in New Zealand "a top, called *kaihora*, nicely formed and managed as it is by us, supplies another of their amusements."

Codrington² says: "Tops are made in the Solomon islands of the nut of a palm and a pin of wood, the whole visible length of which, between two and three inches long, is below the head. To spin the top, a double string is wound round the shaft, and the two ends pulled smartly asunder. A similar top was used in Pitcairn island by the half Tahitian children of the Bounty mutineers."

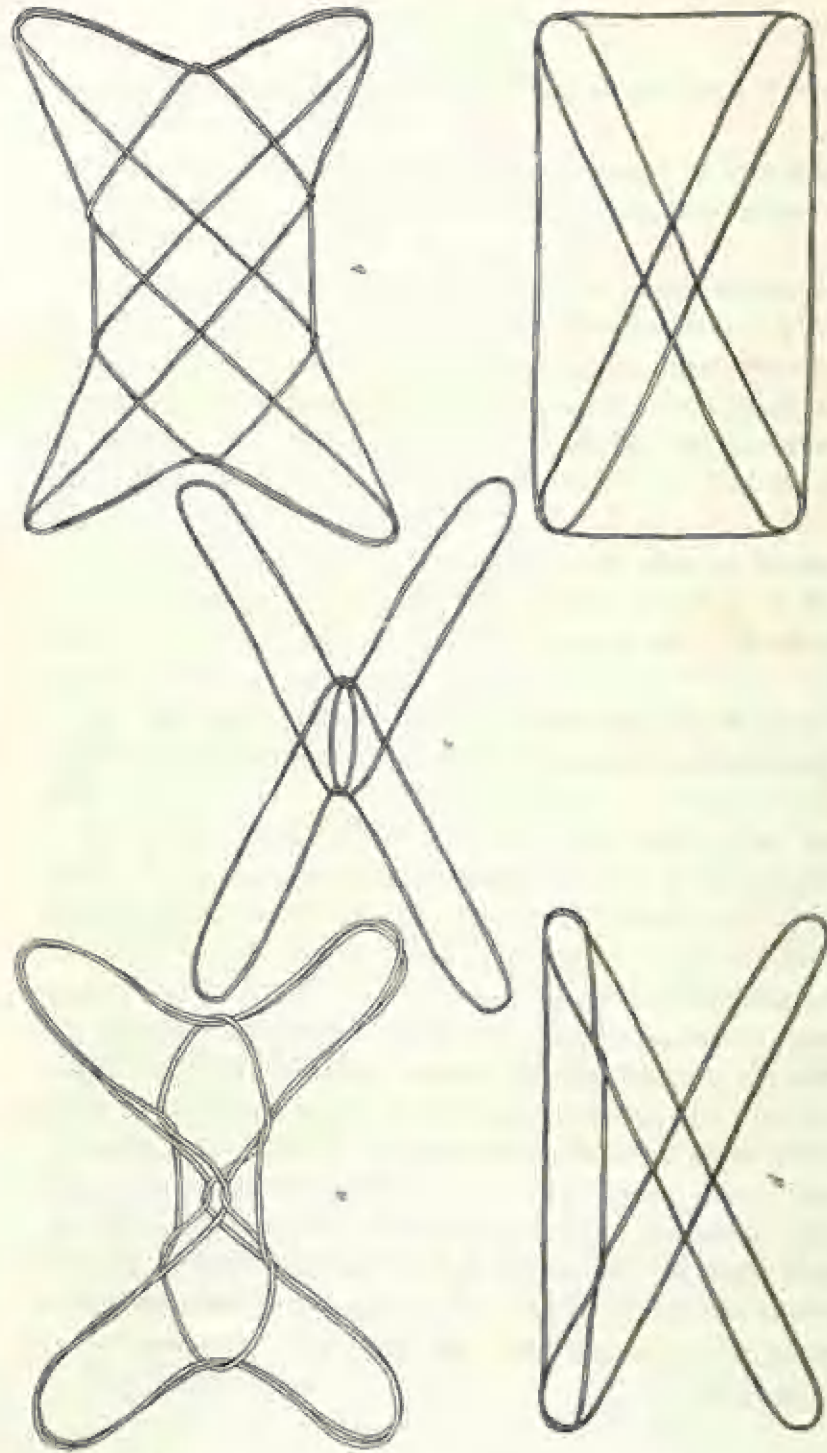
45. *Ha-no*: SQUIRT-GUN.—Squirt-guns are made of bamboo. Boys and girls play with them on holidays, especially on New Year's day. A specimen in the Berlin Museum für Völkerkunde is made of gourd (*i-pu ha-no-ha-no*).

46. *Hu-a ko-pa*: SOAP-BUBBLES.—Soap-bubble blowing is an amusement of children. *Ko-pa* is the Hawaiian pronunciation of soap.

47. *Hei*: CAT'S-CRADLE—A number of cat's-cradles were known to my informants, among which are: (1) *hoo-ko-mo* (plate XIV, *e*); (2) *e-ke-ma-nu*, "ace of diamonds" (plate XIII, *e*); (3) *e-ke-ha-ka*, "ace of hearts" (plate XIII, *a*); (4) *e-ke-pe-ki*, "ace of spades" (plate XIV, *c*); (5) *a-na-ma-nu*, "bird-house" (plate XV, *a*); (6) *pau-ma-wai*, "pump" (plate XIII, *c*); (7) *pa-hi-o-lo*, "saw" (plate XV, *b*); (8) *ma-hi-ki*, "see-saw" (plate XIII, *d*); (9) *wai-u-la-wa* (plate XV, *e*); (10) *ko-he*, "vagina" (plate XIV, *f*); (11) *o-ko-le-a-mo* (plate XIV, *d*); (12) *pa-pi-o-ma-ka-nu-i-nu-i* (plate XIV, *a*); (13) *pa-pi-o-ma-ka-lui-lui* (plate XV, *d*); (14) *u-pe-na*, "net" (plate XIV, *b*); (15) *pou*, "post" (plate XV, *e*); (16) *po*, "darkness" (plate XIII, *b*). Many others are said to be known. A single player makes them with great rapidity, but sometimes another is called on for assistance. The name, *hei*, "net," applied to the game is

¹ Op. cit., vol. II, p. 32.

² Op. cit., p. 342.



HAWAIIAN CAT'S-CRADLES

In the Museum of Anthropology, University of Pennsylvania.—a. *Ki-kiki-kiki-kiki*—see of house (No. 21,526); b. *Pu-dak-hua* (No. 21,465); c. *Pu-ma-ma-ma*—pump (No. 21,446); d. *Mu-kiki*—pump (No. 21,464); e. *Ki-kiki-kiki-kiki*—see of diamonds (No. 21,465).

said to be derived from that of our "cradle," which is given that name. The cat's-cradle called *po*, or "darkness," may have had the same significance as that of New Zealand described by Taylor.¹ He says: "*He whai* or *maui*, a game very similar to our own, but the cord is made to assume many more forms, and these are said to be different scenes in their mythology, such as *Hine-nui-te-po*, Mother Night bringing forth her progeny, Maru and the gods, and Maui fishing up the land. Men, canoes, houses, etc., also are represented. Some state that Maui invented the game."

Codrington² says: "Cat's-cradle, in Lepers' island *lelegaro*, in Florida *honggo*, with many figures, is common throughout the islands."

48. *Pu-la-au*: WOOD-PUZZLE.—A cord is doubled and passed with a noose through two or three holes in a block of wood (plate XII, *d*), the object being to remove the block while another person holds the end of the cord. A variation in form is shown in plate XI, *c*, the *pu-waa-pa*, or "canoe" puzzle. Concerning this my informants stated that it illustrated the following story: "King Kamehameha had a daughter named Kea-hi, who became *enceinte* by a lover of low rank. The king ordered her to be placed in a canoe and taken out to sea and exposed to the elements to die. The canoe was secured by a long rope to the land. Her lover swam out to the canoe and unloosened the rope, and the two escaped in the canoe to another island." A puzzle precisely identical with the block with two holes exists in the writer's collection (16,065) from Saharanpore, India, while another (16,080) with two blocks (perforated canes) at each end of the cord was collected from the Accawais Indians of British Guiana. The last is duplicated by a modern French example (15,519) purchased in Paris.

49. *O-ki-kau-la*: STRING-CUTTING.—One person prepares a string which another cuts at a place indicated, whereupon the first puts the two ends in his mouth and withdraws them united.

¹ Op. cit., p. 172.

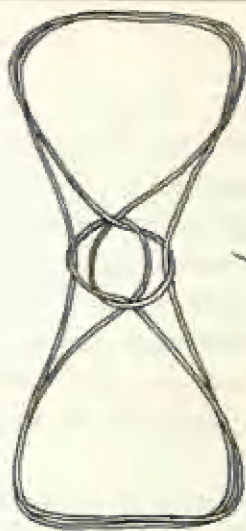
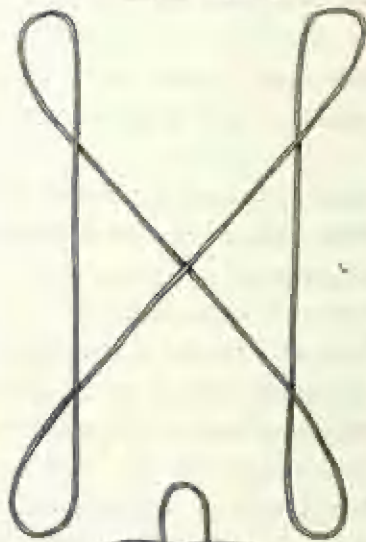
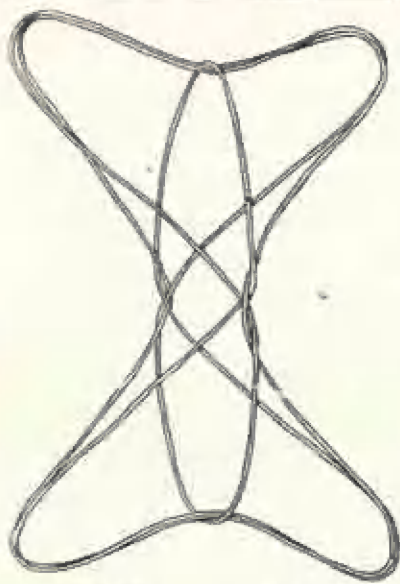
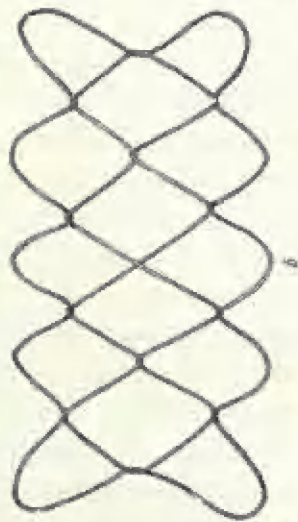
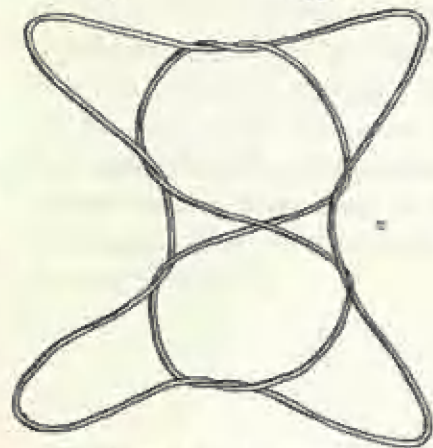
² Op. cit., p. 341.

50. *Pu-kau-la*.—A trick of twisting a cord around the fingers or tying it around the arm or leg in such manner that, while seemingly secure, it comes off with a slight pull. The name is from *pu*, and *kau-la*, a rope. *Pu* or *puu* among other meanings is explained by Andrews as "to cast or draw lots (a Hawaiian custom formerly in practice) by using a knotted string." This is a common amusement in Japan, but my Japanese acquaintances have no particular name for it. Dr Bolton tells me that in Austria-Hungary a similar trick is played by *Bauern Fänger* and is called *Kettelszichen*.

51. *Lu-pe*: KITES.—Kites are made of kapa cloth with sticks (*la-au lu-pe*) of *wi-li-wi-li* wood. Six forms were described by my informants: *lu-pe ma-nu*, or "bird kite"; *lu-pe hui-na-ha*, or "four-sided kite"; *lu-pe le-le*; *lu-pe ho-ku*, "star kite"; *lu-pe ma-hi-ni*, "moon kite"; and *lu-pe ka-na-pi*, "centipede kite." These are illustrated in plate XVI.

The first has a bow of bamboo and two sticks crossed at right angles; the triangles above and below the bow are bound with cord (*kau-la ku-i-na*); tails (*hu-e-lo, we-lo-we-lo*) are fastened at the sides, but none at the extremity. The four-sided kite has two crossed sticks with two binding sticks and is lashed with cord about the edges; it has a long tail with strips of kapa attached, called *kai-kai-a-po-la*. The *lu-pe le-le* (plate XVI, *c*) has a similar long tail. The *lu-pe ho-ku*, or "star kite" (figure *d*) has four sticks crossed in the middle, the edge being formed by a cord tied with a radial cord between each of the sticks. The *lu-pe ma-hi-ni*, or "moon kite" (figure *e*), has three sticks, a long vertical one, crossed by two parallel horizontal sticks, and an exterior hoop of bamboo. Both star and moon kites have tails (*kai-kai-a-po-la*).

The kite strings (*a-ho*) are made of kapa. Men fight kites, one man entangling (*hoo-wi-u-wi-u*) his line with another's and endeavoring to bring down his antagonist's kite. They bet on the result. The kite called *lu-pe le-le* is said to be used invariably for this purpose.



HAWAIIAN CAT'S-GRADLES

In the Museum of Archeology, University of Pennsylvania.—*a*, *Papua-ma-da-ma-da-ma-da* (No. 31,480); *b*, *Ufema-nat* (No. 31,480); *c*, *Ufema-nat* (No. 31,480); *d*, *Ufema-nat* (No. 31,480); *e*, *Ufema-nat* (No. 31,480); *f*, *Ko-ko-vagina* (No. 31,433).

Concerning kites in Tahiti, Ellis¹ says: "The boys were very fond of the *uo*, or kite, which they raised to a great height. The Tahitian kite was different in shape from the kites of the English boys. It was made of light native cloth instead of paper, and formed in shape according to the fancy of its owner."

Taylor² describes the New Zealand kite under the name of *te kahu*, or *he manu waka-tuku-tuku, he pakau*. "The name *kahu* is that of a bird like the hawk. Their figure is generally a rough imitation of that bird, with its great outspread wings. These kites are frequently made of very large dimensions of *raupo* leaves, a kind of sedge, neatly sewed together, and kept in shape by a slight frame-work."

Dieffenbach³ says of the New Zealand kite: "Their kite (*manu* or *pakau pakaukau*) is of a triangular form, and is neatly made of the light leaves of a sedge; it is held by a string made of strips of flax tied together, and its ascent is accompanied with some saying or song. It is a sign of peace when it is seen flying near a village."

Rev. William Wyatt Gill⁴ says of kite-flying:

"In times of peace this was the great delight of aged men. Kites were usually five feet in length, covered with native cloth, on which were the devices appropriate to their tribe—a sort of heraldry. The tail was twenty fathoms in length, ornamented with a bunch of feathers and abundance of sere *tī* leaves. Parties were got up of not less than ten kite-flyers, the point of honor being that the kite should fly high and be lost to view in the clouds. Songs made for the occasion were chanted meantime. It was no uncommon event for them to sleep on the mountain, after well securing the kites to the trees. Of course the upshot of all this would be a grand feast, in which the victor got the biggest share. So serious was this employment that each kite bore its own name, and tears of joy were shed by these grey-bearded children as they witnessed the successful flight. When desirous at length of putting an end to their sport, if the wind were too strong to allow the

¹ Op. cit., vol. 1., p. 228.

² Op. cit., p. 172.

³ Vol. II., p. 31.

⁴ *From Darkness to Light in Polynesia*, London, 1894, p. 39.

string to be pulled in, it was customary to fill a little basket with mountain fern or grass and whirl it along the string. The strong trade winds would speedily convey this 'messenger' to the kites, which then slowly descended to the earth. Children's kites were, and still are, extemporized out of the leaves of the gigantic chestnut tree. Sometimes one sees a boy (no longer grandfathers) flying a properly made kite."

Wilkes' says of the Kingsmill islanders, that their kites are made of pandanus-leaf, reduced to half its thickness, which renders it lighter than paper, and they are prettily shaped.

Codrington¹ says: "Kites, used in fishing in the Solomon islands and Santa Cruz, are used as toys in the Banks' islands and New Hebrides, though not commonly of late years. They have their season, being made and flown when the gardens are being cleared for planting. The kite is steadied by a long reed tail, and a good one will fly and hover very well. The name is in Banks' islands *rea*, in Lepers' island *mala*, an eagle."

52. *Hoo-lei-po-po*: CUP AND BALL.—A ball (*po-po*) made of rags of kapa is tied by a cord fastened to the middle of a stick about eight feet long, at the end of which a pocket (*pa-ke-ke*) is attached. The stick is grasped by the other end, and the object is to swing the ball and catch it in the pocket. Two or more play. When one misses, the next takes a turn. The maximum count is one hundred. There are two specimens in the Berlin Museum, one with a kapa and the other with a cocoanut ball. Another (plate XII, *f*) is figured in the *Ethnographic Album of the Pacific Islands*, where it is described as consisting of a light wand of twisted leaf-ribs with a loop at the end. Plate XII, *g*, shows a gourd musical instrument (probably a lover's whistle, *i-pu ho-ki-o-ki-o*) attached by a string ornamented with tufts of feathers.

In Captain King's journal of Cook's voyage to the Pacific ocean,² he says that young Hawaiian children have a favorite amusement which shows no small degree of dexterity. They

¹ Vol. v, p. 100.

² Page 342.

³ Vol. III, p. 147.

take a short stick, with a peg, sharpened at both ends, running through one extremity of it and extending about an inch on each side; and throwing up a ball made of green leaves molded together, and secured with twine, they catch it on the point of the peg; and immediately throwing it up again from the peg, they turn the stick around, and thus keep catching it, on each peg alternately, without missing it, for a considerable time.

53. *Ku-he-le-mai*.—A game played with an awl-shape object, having a wooden handle pointed with a needle which is tossed from the hand, the object being to make it stand erect. The players play in turn, and each continues until he misses. The name is explained by Andrews as from *ku*, "to rise," *he-le*, "to move," and *mai*, "this way."

54. *Nou-nou-pu-ni-u*: COCOANUT-SHELL-CASTING.—A coconut is hollowed out and suspended by a cord, and the players throw at it with balls made of kapa. One acts as banker, and pays a prize to a player who hits the cocoanut a certain proportional number of times.

55. *Ki-ni-ho-lo*.—A ball game, described by native informants as played with a rag ball made of kapa, which is struck with the open hand. From *ki-ni*, and *ho-lo*, "to run." Andrews states that it is similar to baseball. He gives *ki-ni-po-po* as a general name for all games of ball.

56. *Pe-ku-ki-ni-po-po*: BALL-KICKING.—A game of football was formerly played with a large ball made of kapa. A hole somewhat larger than the ball was dug in the ground on each side as a goal, and the object of the game was to force the ball into the opponent's hole. Football is now played with a rubber ball, with two posts with a string across at opposite sides as goals. This form is of recent introduction.

57. *Pa-na-pa-na lu-a*: PIT-SHOOTING.—Played by several persons with beans, *pa-pa-pa*, each contributing the same number. A small hole is dug, beside which they put all their beans together. The first player then flips the beans into the hole,

one by one, with his thumb and forefinger, continuing until he misses. The next then follows, and so on in turn until the beans are all flipped in the hole. The one who puts the last bean in wins the game.

58. *Ki-o-la-o-la*.—A play with small stone balls by one person who keeps three in the air at the same time.

Captain King,¹ speaking of the game with a ball of green leaves, says: "They are not less expert at another game of the same nature, tossing up in the air and catching in their turn a number of these balls; so that we frequently saw little children thus keep in motion five at a time. With this latter play the young people likewise divert themselves at the Friendly islands."

Stair² thus speaks of the game in Samoa: "*O fuanga* consisted in throwing up a number of oranges in the air, six, seven, or eight, and the object was to keep the whole number in motion at once as the Chinese jugglers do their balls. *O le teaunga* was also played with a number of oranges, but in this game they were thrown up backwards."

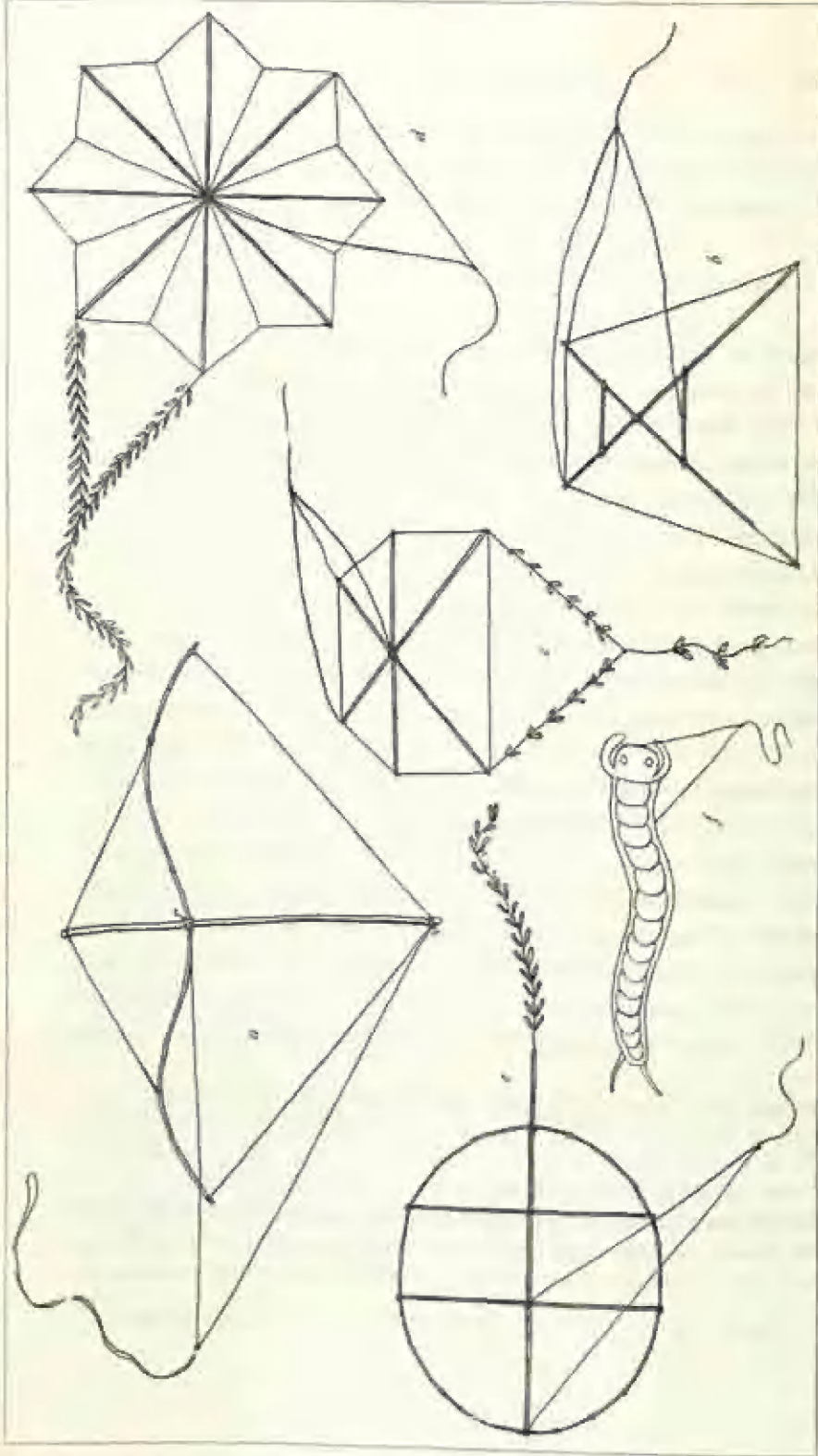
59. *Ki-mo-ki-mo*: JACKSTONES.—Played by two or more persons with a number of small stones (*po-ha-ku*). Each player has his own stone, called *a-li-i*, "chief." The game is practically identical with that played by children in the United States. The stones of all the players are placed on the ground; one begins by tossing his stone up, grabbing the others, tossing them and catching them all together. He continues until he misses. It is employed for gambling purposes. Of this game Ellis³ says:

"*Timo*, or *time timo*, was another game [of Tahiti]. The parties sat on the ground, with a heap of stones by their side, held a small round stone in the right hand, which they threw several feet up in the air, and, before it fell, took up one of the stones from the heap, which they held in the right hand till they caught that which they had thrown up, when they threw down the stone they had taken up, tossed the round stone again, and continued taking up a fresh stone every time

¹ Vol. III, p. 147.

² Page 138.

³ Vol. I, p. 227.



HAWAIIAN KITES

a. *Loupe ma-aw*—bird kite (No. 17, 1844, Museum of Archaeology, University of Pennsylvania); b. *Loupe ka-i-ma-o-o*—square kite; c. *Loupe ka-i-ma-o-o*—square kite; d. *Loupe ka-i-ma-o-o*—square kite; e. *Loupe ka-i-ma-o-o*—square kite; f. *Loupe ka-i-ma-o-o*—square kite. The last four are from native drawings.

they threw the small round one into the air, until the whole heap was removed."

Dieffenbach,¹ speaking of New Zealand, says: "Another game is called *tutukai*, and is played with a number of pebbles."

Of the game in Samoa, Wilkes² says: "*Lafo litupa* is played by two persons, who place about 50 beans of the *Mimosa scandium* before them; then taking up four at a time, they throw them up in the air, and catch them on the back of the hand; the player who catches 100 soonest is the winner."

Williams³ describes the *lavo* of the Fijians, "a game at pitching the fruit of the *walai* (*Mimosa scandens*). The fruit is flat and circular, and from its resemblance in form to money, money is also called *ai lavo*."

60. *Pi-li-ka-la*: COIN-BETTING.—This name is applied in particular to two games with coins—"pitching pennies" and "heads or tails." The first is played by several men who draw a line and throw at it, the one whose piece comes nearest, winning. In the second, the players select either heads or tails. They toss for position, and the first player throws all the coins up and takes those that fall as he bet. The game is played with Hawaiian nickels or five-cent pieces. *Ka-la* is the Hawaiian for "dollar"; hence silver, silver coin generally, Andrews gives the general name for gambling and betting as *pi-li-wai-wai*, and says that the ancient forms were almost innumerable. *Wai-wai* means "goods," "property."

61. *Pa-na-pa-na-hu-a*: "SEED-SHOOTING," MARBLES.—The seeds of the *ka-ka-lai-o-a* plant (*Cæsalpina bonducella*), which are nearly spherical, are used as marbles. Any number play, and each puts the same number into a ring on the ground 10 to 12 feet in diameter. They shoot in turn from the edge of the ring, endeavoring to knock the marbles out. When a player knocks one out he may place his taw or shooter (*ki-ni*) in the ring. If a succeeding player who has not knocked a marble chances to

¹ Vol. II, p. 32.

² Vol. II, p. 136.

³ Page 127.

hit this shooter he goes out of the game; but if he has knocked a marble out, the one whose shooter is hit forfeits the entire number first put into the ring. The shooters, larger seeds, are valued at five of the ordinary ones which are called *hu-a ma-pa-la* or *hu-a ki-ni-ki-ni*, *hu-a* meaning seed. The game is said to be called also *le-na pa-ka* (*le-na*, "to shoot; *pa-ka*, "to fight").

Dr Edward Palmer collected for our National Museum the seeds of the *Casalpina bonducella* in Florida, where, he reports, they are used by children as marbles under the name of "nicker" seeds.

62. *Ki-o-la-o-la-la-au*: "STICK-CASTING," TIP CAT.—Tip cat is played with two sticks made of *ko-a* wood, one about 6 inches in length (*la-au po-ko-le*, "short stick") placed so that its ends rest on the edges of a small hole scooped in the ground, and the other the bat (*la-au hi-li*, "striking stick," or *la-au lo-i-hi*, "long stick"), which is longer. The cat is tossed by thrusting the bat beneath it and striking it in the air. The distance it falls is measured with the bat, and the one who thus first counts one hundred wins the game. The game is also called *pa-a-ni la-au*, from *pa-a-ni*, "to play," and *la-au*, "wood."

Stair¹ refers to "the English schoolboy's game of cat, but played in the water instead of on the land," as among the games of the Samoans.

63. *Ki-no-a*: HOP-SCOTCH.—A diagram is drawn upon the

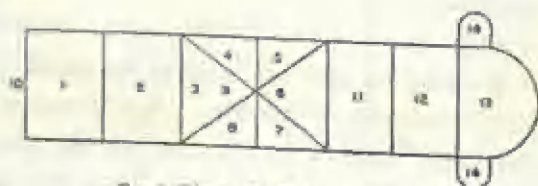


FIG. 6.—Diagram for *Ki-no-a*, hopscotch.

ground as shown in figure 6. The players hop on one foot and kick a flat stone into the several divisions in the order indicated

¹ Page 139.

by the numerals. The end (13) is called *la-ni*, "sky" or "heaven," or *pa-hu*. The divisions on each side are called *pe-pei-ao*, "ear."

64. *He-lu-pa-ka-hi*: "ONE-BY-ONE-COUNTING."—Two persons simultaneously put out their fingers and count, first one finger, crying "one;" then two, crying "two," and so on up to ten, repeating ten times. The game is played very rapidly, and if a player makes an error he loses, otherwise the one first completing the count wins. This game is also called *ku-la li-ma*, from *ku-la*, "school," and *li-ma*, "finger," from its being used, presumably, as a school exercise. It is not the same as the Chinese game of *ch'ái mǎi*, or the Italian *morra*.

Of the Samoan game Stair¹ says: "*O le talinga matua*, also called *O le lupuin ga*, was a game of counting, played by two persons sitting opposite each other. One of them held up his closed hand to his companion, and immediately after showed a certain number of fingers, quickly striking the back of his hand upon the mat, directly after. His companion was required to hold up a corresponding number of fingers immediately after, in default of which he lost a point in the game."

J. S. Polack² says of the game in New Zealand: "The game of *Ti* is much indulged in. It consists of a party counting in unison with the fingers; on a number being given, the players must instantly touch the finger denoting the said number, and an error in this active performance is productive of much mortification to the native; the dexterity with which it is played can only be accomplished by continual practice."

65. *Pi-li-li-ma*: "HAND-BETTING."—Two players simultaneously extend their closed hands containing marbles, money, or similar small objects, at the same time crying a number. The one who guesses the sum of the objects wins them all.

66. *Pee-pee-a-ku-a*: "GHOST-HIDING," HIDE-AND-SEEK.—The one who is "it," called *a-ku-a*, "ghost" or "god," is determined

¹ Page 138.

² *Manners and Customs of the New Zealanders*, London, 1840, vol. II, p. 171.

by counting out. Andrews gives *han-pee-pee* as the name of the game. In Japan it is called *oni gokko*, "devil playing." Hide-and-seek is referred to by Stair¹ among the amusements of the Samoans, and by Williams² as a Fijian game. Taylor³ mentions hide-and-seek in New Zealand under the name of *he waka pupuni* or *piri*. Codrington⁴ says: "In the Banks' island boys play at hide-and-seek, *rur quona quona*; there are two sides, and if the boy who is hiding is not found by the seekers, he suddenly jumps up and counts a pig against them."

67. *He-lu-pa-a-ni*: "PLAY-COUNTING," COUNTING-OUT.—The following counting-out rhymes were related:

Mo-ke mo-ke a-la pi-a
How many *mo-ke a-la pi-a*?
One, two, three, four, *au-ka hi-a*,⁵

Ki-li ki-li ka,
A-ka-hi ou o-i ha
Pa-e-le pa-ki-ni
I-kau-a le-hei pa
Mai no a-la-ea
Mo-mo-na ka-pe-le-na
Ka-i-o-le wi-lu,⁶

68. *Pla-pi-o*: "PRISONER-PLAY," TAG.—The one who is "it" (*a-ku-a*) is determined by counting out. He chases the others, and the one first tagged becomes *a-ku-a* in turn. *Plaa* is the English word "play," Hawaiian *pa-a-ni*.

69. *Ho-lo-pee-a-na-lo*.—A game of hiding played by a number of boys. When all are ready one of the boys pounds on the back of the *a-ku-a*, singing the following song while the others hide:

Ku-i-ku-i ka-mu-mu-mu
Ho-lo i-s-ka ho-lo-kai.

¹ Page 139.

² Page 127.

³ Page 174.

⁴ Page 340.

⁵ Probably a variant of "Monkey, monkey, bottle of beer, | How many monkeys are there here? | One, two, three, | Out goes he!"—a counting-out rhyme reported by Dr H. Carrington Bolton (*The Counting-out Rhymes of Children*, New York, 1888, p. 116) from many parts of the United States.

⁶ Similar to a counting-out rhyme from Hawaii given by Dr Bolton, *op. cit.*, appendix.

70. *Po-ai-pu-ni*: BLIND-MAN'S-BUFF.—Children clasp hands in a ring, within which one stands blindfolded. The children dance around, and as they dance the *ma-ka-po* or "blind-man" catches one and then tries to guess who it is. Ellis¹ says that in Tahiti *tupaurupauru*, a kind of blind-man's-buff, was a favorite juvenile pastime, and Williams² mentions blind-man's-buff in Fiji.

71. *Pa-a-ni a-lu a-lu*: PRISONER'S BASE.—A number of boys play, half on a side, each with its base (*pa-hu*). A boy will run out from either side, and those opposite will try to catch him and bring him to their goal. Stair³ mentions a game played in Samoa by a given number of young men who chose sides, the game appearing to resemble the English game of prisoner's base. J. Stanley Gardiner⁴ says that in Rotuma "on moonlight nights the beach is alive with the girls and the boys, singing and playing all sorts of games. A favorite one of these is a sort of 'prisoner's base'; a kind of base is marked off, and then one side hides, while the other side searches for them; they have, if possible, to get back within this base."

72. *Pa-na-i-o-le*: "MICE-SHOOTING."—Shooting mice with bows and arrows, according to Alexander,⁵ was engaged in only by chiefs, and connected with religious ceremonies. The bow was never used in war, but only for the above purpose. The deified bones of the chiefs were generally carefully concealed in the most secret and inaccessible caves to prevent their being made into arrows to shoot mice with, or into fish-hooks.

73. *Mo-ko-mo-ko*.—A national sport, practiced on holidays when village champions are opposed to each other. The contestants stand a certain distance apart and throw in succession seven spears, seven stones, seven stone axes with handles, and seven wooden knives, one at the other and then back again. If a player is hit he loses. The game is hazardous and exciting.

¹ Page 228.

² Page 127.

³ Page 136.

⁴ *Journal Anthropological Institute*, vol. XXVII, p. 488.

⁵ Vol. I, 91.

Mo-ko-mo-ko is defined by Andrews as "to box; to fence; to fight; to hold boxing matches as pastimes or games."

In New Zealand, Taylor¹ says, *te para mako* consisted in throwing sharp-pointed sticks at each other, and skilfully warding them off by turning the body away when they saw the dart coming. Sometimes an unskilful person lost his life in playing this game.

Codrington² says: "In the Solomon islands the great game is throwing and dodging spears, or sticks instead of spears. This is to some extent represented in the Banks' islands by two parties throwing native oranges at each other."

74. *Ke-a-pu-a*: "ARROW-THROWING."—Arrows or darts, consisting of the blossom end of the sugar-cane, are thrown in the following manner: A cord is wrapped around the middle of a cane arrow, the other end being fastened to a stick about four feet long (*la-au-ke-a pu-a*), which is held vertically at right angles to the arrow, which rests on the ground. The latter is then hurled in the air by the stick, the wrapped cord giving it a rotary motion. Four persons play, boys against boys or girls against girls, or two boys against two girls. The one whose arrow goes farthest, wins. It was formerly a man's game. It would appear from Andrews that the fore-end of the *pu-a* was tied with string to prevent splitting. The arrows are also called *pa-pu-a*, from *pa*, "to throw," and *pu-a*, "cane arrow."

Ellis³ says that in Tahiti a game called *aperoa* prevailed. It consisted in jerking a reed, $2\frac{1}{2}$ or 3 feet in length, along the ground. The men seldom played at it, but it was a common diversion of women and children.

Speaking of the amusements of the Samoans, Stair⁴ says: "*O le tangati'a* was played by many persons at once, each one endeavoring to propel a small light rod of the *fu'a fu'a*, from which the bark had been peeled off as far as possible. The forefinger

¹ Page 173.

² Page 341.

³ Vol. I, p. 227.

⁴ Page 138.

was placed upon the head of the stick, when it was thrown down and caused to glide over the ground to a distance of 30 or 40 yards or more."

Wilkes¹ describes *litia* as a general sport of the Samoans, sometimes whole villages playing against each other. Two parties furnish themselves with light sticks of the *Hibiscus tiliaceus*, about 8 or 10 feet long and as thick as a finger; the bark is stripped off, making them very light. The two parties arrange themselves in a line, and strive to throw these sticks as far as possible; the party who succeeds in throwing fifty the farthest wins the game. The usual distance to which they throw is about 40 yards, and one would conceive it almost impossible for them to be thrown so far. A grand feast usually terminates the sport, the expense of which is borne by the losing party.

Williams² describes an athletic sport in Fiji under the name of *tiga*, or *ulu-toa*. This game is played by throwing from the forefinger a reed 3 or 4 feet long armed with a 6-inch oval point of heavy wood. The weapon is made to skim along the ground to a distance of 100 yards or more. Nearly every village has near it a long level space kept clear of grass for the practice of this favorite exercise.

J. Stanley Gardiner³ says that in Rotuma "the Fijian game of *tiga*, or *ulutoa*, used to be very popular; it is now only played by the boys. Properly it seems to be a Fijian game, and was doubtless introduced from there. It is played by throwing from the forefinger, covered with a piece of cloth, a reed about 4 feet long, armed with a pointed piece of hard and heavy wood, 3 to 6 inches long. It is thrown along the ground, bouncing over it, the winner being he who can throw it furthest."

Taylor⁴ describes *heteka*, or *neti*, as a game played in New Zealand with fern stalks, which are darted to see who can throw them the farthest.

¹ Vol. II, p. 136.

² Page 128.

³ *Journal Anthropological Institute*, vol. XXVII, p. 487.

⁴ Page 173.

Codrington¹ says:

"A game which belongs to Banks' Island and New Hebrides is *tika*, the Fiji *tiga*, played with reeds dashed in such a manner upon the ground that they rise in the air and fly to a considerable distance. In some islands, as Santa Maria, a string is used to give impetus, and in some the reed is thrown also from the foot. The game is played by two parties who count pigs for the furthest casts, the number of pigs counted as gained depending on the number of knots in the winning *tika*. There is a proper season for the game, that in which the yams are dug, the reeds on which the yam vines had been trained having apparently served originally for the *tika*. It is remarkable that in Mota a decimal set of numerals is used in this game, distinct from the quinary set used on every other occasion of counting."

75. *Pa-hee*.—According to Ellis² this is—

"a favorite amusement with farmers, and common people in general. The *pa-hee* is a blunt kind of dart, varying in length from two to five feet, and thickest about six inches from the point, after which it tapers gradually to the other end. These darts are made with much ingenuity, of a heavy wood. They are highly polished, and thrown with great force or exactness along the level ground, previously prepared for the game. Sometimes the excellence of the play consists in the dexterity with which the *pa-hee* is thrown. On these occasions two darts are laid down at a certain distance, three or four inches apart, and he who, in a given number of times, throws his dart most frequently between these two, without striking either of them, wins the game. At other times it is a mere trial of strength; and those win, who, in a certain number of times, throw their darts farthest. A mark is made in the ground, to designate the spot from which they are to throw it. The players, balancing the *pa-hee* in their right hand, retreat a few yards from this spot, and then springing forward to the mark, dart it along the ground with great velocity. The darts remain wherever they stop, till all are thrown, when the whole party runs to the other end of the floor, to see whose have been the most successful throws. This latter game is very laborious."

Brigham³ states that the *pa-hee* could be and was used as a weapon (see plate XII, a). The material was always *kau-i-la* or

¹ Page 340.

² *Preliminary Catalogue*, part II, p. 59.

³ Vol. IV, p. 197.

u-hi-u-hi wood. Each contestant had ten trials. The same *ka-hu-a*, or course, was also used for *mai-ka* (number 78).

76. *Mo-a*.—This is a game played with a *mo-a*, a club similar to the *pa-hee*, but shorter. In either game there was no exact rule for weight or length of stick, but each player suited his own want. It is described as a prominent means of gambling.

77. *Ka-hu-a-ko-i*.—This is described by Andrews as "a species of pastime on the *ka-hu-a* with the *ko-i*." *Ko-i*, among other things, means a small hatchet. The game appears to be similar to *pa-hee* and *mo-a*. Andrews gives *ko-i* as "the name of a play; a sort of race in sliding."

78. *Mai-ka*.—Described by Brigham¹ as a game played with the *u-lu* or *o-lo-hu*. The first name was current on Hawaii and Kauai, and the latter was known on Maui and Oahu. A smooth alley, or *ka-hu-a*, was required and three forms of the game were common. The first was a trial of strength, or throwing, or rather bowling, to the greatest distance; the second required more skill to drive the *u-lu* between two sticks near the end of the *ka-hu-a*; the third was rather a trial of the *u-lu* than of the players, as they were rolled against each other and the toughest won the game for its owner. There is a famous *ka-hu-a* near Kalae on Molokai, where may be seen hundreds of broken *u-lu*. The players trained carefully and developed great strength. Various kinds of stone were used, but a heavy compact coral rock was the favorite; the *u-lu* was sometimes spherical, but usually a thin cylinder with slightly convex ends (plate XII, *b*). The largest *u-lu* of the first form in the Bishop Museum has a diameter of $7\frac{1}{2}$ inches and weighs 22 pounds. Of the second and more common form the largest is 5 inches in diameter, 3 inches thick, and weighs 44 ounces. The smallest has a diameter of $1\frac{1}{2}$ inches and weighs $3\frac{1}{2}$ ounces. Rough and unfinished *u-lu* were used by children for practice. The average weight was a little over a pound. Choice ones were carefully oiled and kept in kapa. The *u-lu* exhibited in the Bishop Museum

¹ *Preliminary Catalogue*, part II, p. 56.

are made of lava, coral, breccia, conglomerate, limestone, and olivine, and there is one of wood.

Ellis¹ says that the game of *mai-ka* is played upon the same floor as *pa-hee*. Two sticks are stuck in the ground only a few inches apart, at a distance of 30 or 40 yards, and between these, but without striking either, the parties at play strive to throw their stone. At other times the only contention is, who can bowl it farthest along the *ka-hu-a*, or floor. The people are, if possible, more fond of this game than of the *pa-hee*; and the inhabitants of a district not infrequently challenge the people of the whole island, or the natives of one island those of all the others, to bring a man who shall try his skill with some favorite player of their own district or island. On such occasions we have seen seven or eight thousand chiefs and people, men and women, assembled to witness the sport, which, as well as the *pa-hee*, is often continued for hours together.

Andrews gives *ne-we-ne-we-we* as "the exclamations of people when they play at *mai-ka*, while the stone is rolling and they cheer it on." Also *hu-i-pa*, *i-ki-ma-ku-a*, and *ka-la-ma-u-la* as names of species of stone out of which *mai-ka* are made. Andrews also states that since the introduction of bowling alleys *u-lu-mai-ka* has been applied to the game of bowls. My informants say the old game has disappeared, and that they apply the name to the game of bowls with pins.

79. *Ki-lu*.—A play with a small gourd, which was unknown to my native informants. A specimen in the British Museum (plate XII, c) is figured in the *Ethnographic Album of the Pacific Islands*, where it is described as a top played at night in a lascivious game. It is spun through the air at a specific object, the forfeit being at the expense of the woman.

Alexander states that the game of *ki-lu* (and *u-me*) was always played at night, in an inclosure made for the purpose, and was connected with many vile associations. The *ki-lu* itself was a

¹ Vol. IV, p. 198.

small gourd of peculiar shape, which was thrown at a stick set up at a distance.

Andrews gives *lo-ha* as a kind of sport in former times, the same as *ki-lu*; also *he-lu-ai* as the office of a person engaged in the play of *ki-lu*, and *hau-na* as the striking of the hand or other substance in playing the *ki-lu*.

80. *Ki-o-la-o-la-le-na*: "RING-CASTING."—A game of casting iron rings over a small stake or pin. The rings are about an inch in interior diameter. Four men play, each with ten rings. The one who puts the most rings on the pin wins the prize. On the birthday of King Kamehameha I, rings made of sections of coconut shell (*le-na-ni-u*), wrapped with kapa to prevent their breaking, are used in a similar game, in accordance with old custom. My informants state that stone rings also were anciently used.

81. *Pu-he-ne-he-ne*.—A game in which a stone called a *no-a* was concealed in one of five places (*puu*) under a kapa, the object being to guess under which it was hidden.

Ellis¹ describes it as one of the most popular games of the Hawaiian islands, the favorite amusement of the king and higher order of chiefs, and frequently occupied them whole days together. Those who play sit cross-legged on mats spread on the ground, each holding in his right hand a small elastic rod, *ma-i-le*, about three feet long and highly polished (plate XII, 4). At the small end of this stick is a narrow slit or hole, through which a piece of dogskin, with a tuft of shaggy hair on it, or a piece of *ti* leaf, is usually drawn. Five pieces of kapa of different colors, each loosely folded up like a bundle, are then placed between the two parties, which generally consist of five persons each. One person is then selected on each side to hide the stone. He who is first to hide it, takes it in his right hand, lifts up the cloth at one end, puts his arm under as far as his elbow, and passing it along several times underneath the five pieces of cloth, which lie in a line contiguous to each other, he finally leaves it under one

¹ Vol. IV, p. 81.

of them. The other party sit opposite, watching closely the action in the muscles of the upper part of his arm; and it is said that adepts can discover the place where the stone is deposited, by observing the change that takes place in those muscles, when the hand ceases to grasp it. Having deposited the stone, the hider withdraws his arm, and with many gestures, separates the contiguous pieces of cloth into five distinct heaps, leaving a narrow space between each. The opposite party, having keenly observed this process, now point with their wands or sticks to the different heaps under which they suppose the stone lies, looking significantly at the same time, full in the face of the man who hid it. He sits all the while, holding his fingers before his eyes to prevent their noticing any change in his countenance, should one of them point to the heap under which it is hidden. Having previously agreed who shall strike first, that individual, looking earnestly at the hider, lifts his rod and strikes a sharp blow across the heap he has selected. The cloth is instantly lifted, and should the stone appear under it, his party have won that hiding with one stroke; if it is not there, the others strike till the stone is found. The same party hide the stone successively, according to their agreement at the commencement of the play; and whichever party discovers it the given number of times, with fewest strokes, wins the game. Sometimes they reverse it; and those win who, in a given number of times, strike the most heaps without uncovering the stone. Occasionally they play for amusement only, but more frequently for money or other articles of value which they stake on the game.

The five *puu* receive the following names: (1) *ki-hi* or *ki-hi-mo-e*, (2) *pi-li* or *pi-li-mo-e*, (3) *kau*, (4) *pi-li-pu-ka*, (5) *ki-hi-pu-ka*. These are regarded as corresponding to the following divisions of the night: (1) sunset (?), (2) 9 o'clock in the evening, (3) midnight, (4) 3 o'clock in the morning, (5) sunrise (?).

Andrews gives *pu-pu-he-ne*, a row of men in a certain game, presumably *pu-he-ne-he-ne*. He also defines *pe-le*, not only as the name

of a volcano and of the fabled goddess of volcanoes, but also: "4, a stone from a volcano used in the play called *pu-he-ne-he-ne*. See *no-a*."

In Captain King's journal of Cook's voyage to the Pacific ocean,¹ he says: "They have another game which consists in hiding a stone under a piece of cloth, which one of the party spreads out, and rumples in such a manner that the place where the stone lies is difficult to be distinguished. The antagonist, with a stick, then strikes the part of the cloth where he imagines the stone to be; and, as the chances are, upon the whole, considerably against his hitting it, odds of all degrees, varying with the opinion of the skill of the parties, are laid on the side of him who hides." Elsewhere he says: "We observed great numbers of small polished rods, about four or five feet long, somewhat thicker than the rammer of a musket, with a tuft of white dog's hair fixed on the small end. These are, probably, used in their diversions."

Corney² says: "They play another game by hiding a stone under three pieces of cloth. Six people play at this game, each party having his stone and cloths and a small wand with which they strike the cloth under which they think the stone is deposited. If they do not guess right the first time, the stone is shifted and so on alternately. I have seen the chiefs sit for a whole day before they decide the game."

A *no-a* in the Bishop Museum (Cat. number 881) is described as the stone of Kalanikupele, the last king of Oahu, who had a large house at Waimanalo where he played this and other games.

My informants stated that this game is not played now in Honolulu, but that they had seen it played by men from Kauai.

J. Stanley Gardiner³ says that in Rotuma "another favorite amusement on the beach is to make a bank of sand, and out of this to scrape a number of holes in the sand. A piece of coral is then taken in the hand and, while these are filled up, hid in one.

¹ Vol. III, p. 145.

² *Journal Anthropological Institute*, vol. XXVII, p. 488.

³ Page 106.

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When they are tired with the rougher games above, the whole beach may be seen strewn with young people, five or six together, playing this game. The unsuccessful in guessing, in which hole the coral has been placed, will be set on by the others, and covered in sand."

82. *Ko-ho-ko-ho-pu-ni-u*: COCOANUT-SHELL GUESSING.—A button of cocoanut-shell (*pi-hi-ni-u*) is concealed under one of two cups of cocoanut-shell, the object being to guess under which it is hidden.

83. *Hu-na po-ha-ku*: STONE-HIDING.—A number of players stand in a row with their closed hands outstretched, and another endeavors to guess in which hand a stone (*po-ha-ku-maa*, "sling stone") is concealed, slapping the hand he selects. If he guesses correctly, the one who had the stone takes his place.

Taylor¹ describes the following game in New Zealand: "*Tutu kai*.—A circle being formed, one takes a little stone, or anything else, in his hand, and then another repeats a verse. A person then goes around the circle, and guesses in whose hand it is hid, each having his fist closed; if he is right, the person who has the stone, takes his place, and goes round; if he is wrong, he continues until he discovers where it is hid."

84. *Lu-lu*.—Four disks of volcanic stone about an inch in diameter and marked on one side (figure 7) are shaken in both hands and allowed to fall at random on the ground. These dice



FIG. 7.—*Lu-lu* dice.—stone dice. (No. 21,444, Museum of Archeology, University of Pennsylvania.)

are marked with a cross as shown in the figure, one with a central dot and the others with two, three, and four dots. The dots and crosses are painted red. Any number play, and each player has

¹ Page 174.

two throws, or rather, if any stone comes unmarked side up, he throws it again. The spots count and the highest throw in a round wins; or the game may be played to a fixed number, as one hundred. If a player throws all marked faces up, it counts ten and he has another throw. The dice are called *u-lu*, the same as the stones used in *mai-ka*. *Lu-lu* means to shake. The throws are called as follows:

Hu-li la-lo, "all down."

Hu-ka-hi hu-li i-lu-na, "one turning up."

E-lu-a hu-li i-lu-na, "two turning up."

E-ko-lu hu-li i-lu-na, "three turning up."

E-ha hu-li i-lu-na, "four turning up."

Ordinary cubical dotted European dice receive the same name of *u-lu* or *u-lu lu-lu*; and dice throwing is called *lu-lu*. Three are commonly employed.

85. *Ko-na-ne*.—According to Brigham,¹ a game "played on a flat surface of stone or wood, and somewhat resembling 'fox and geese' or Japanese gobang (*go*). Positions on the *pa-pa-mu* were marked by a slight depression on stone and often by the insertion of bone, usually chicken (sometimes human), in wood. There seems no definite number of places or arrangement. Beach-worn pebbles—coral for white, lava for black—completed the equipment." Two boards in the Bishop Museum (plates XI, 1, and XII, 2) are stated to have 180 and 83 places, respectively.

In his journal of Cook's voyage to the Pacific ocean² Captain King says: "They have a game very much like our draughts; but, if one may judge from the number of squares, it is much more intricate. The board is about two feet long and is divided into 238 squares, of which there are 14 in a row, and they make use of black and white pebbles, which they move from square to square."

Corney³ says: "Their national game is draughts, but instead of having twelve men each, they have about forty; the board is

¹ *Preliminary Catalogue*, part II, p. 60.

² Page 106.

³ Vol. III, p. 144.

painted in squares, with black and white stones for men, and the game is decided by one party losing all his pieces."

Andrews defines *ko-na-ne* as a game like checkers, a species of *pu-ni-pe-ke*. The stones are placed on squares, black and white; then one removes one and the other jumps, as in checkers. He gives *pa-pa-mu* as the name of the board on which *ko-na-ne* is played, and *i-li-i-li* as pebbles, small stones, used in playing *ko-na-ne*. Also *hi-u* as the name of the counter, and also to move the *hi-u* in playing *ko-na-ne*. *Hi-u-hi-u* is "to practice sorcery" and also "to play *ko-na-ne*." *Pa-hi-u-hi-u* is the "name of a game like *ko-na-ne*," and "to move by jumping as one does in playing *ko-na-ne*." *Lu-na* is the chief piece in the game *ko-na-ne*.

86. *Moo*: DRAUGHTS.—Played on a board or diagram (*pa-pa ko-na-ne*) of 8 by 8 squares (plate XI, *d*) cut on a flat stone, the alternate squares on which the pieces are placed being marked with crossed diagonal lines. The men (*i-li-i-li*), twelve on each side, consist of red pebbles (*i-li-i-li u-la*) and black pebbles (*i-li-i-li e-le-e-le*), which are placed on the marked squares. The play is identical with our game of draughts, except that a king (*a-li-i*, "chief") can move or jump any number of squares, like the queen in chess. There are little holes, *lu-a*, in the center of the marked squares to hold the stones. A king, or *a-li-i*, is made by putting two stones in the hole. The squares are called *ha-le*, "houses."

The game above described, which was communicated to me by the four natives, is not mentioned by the name of *moo* in Andrews' *Dictionary*. It exactly agrees in the king's move¹ with the game of *dama* or draughts played in the Philippine islands, differing in the men being placed within the squares instead of at the intersection of the lines.

87. *Ma-nu*: FOX AND GEESE.—Played on a diagram cut on a stone, consisting of four rectangles placed around a square to form a

¹ The same as in Polish draughts. Speaking of New Zealand, Tregear says: "Draughts, *mā*, some think an introduced game, but I think it can well be proved to be ancient."

cross, the squares all being crossed with intersecting lines. Thirteen stones (*pa-ka*) are arranged as shown in plate XI, *b*. One of the two players, called *pu-ni-pe-ki*, points with a stick (*la-au*) to one of the unoccupied points. The stones move one square at a time and endeavor to pen up the *pu-ni-pe-ki*, who in turn tries to capture the stones. The stick moves one square and jumps over an adjacent piece when the next square beyond is vacant. The player then cries, *Pe-pe-hi ka-na-ka!* When the stick is cornered the opponent cries, *Paa!* ("tight").

This is no doubt the game referred to by Andrews under the name of *pu-ni-pe-ki* (*bo-ne-pa-te, bu-ni-be-ti*), "a game like 'fox and geese.'" It may be that this is a Hawaiian rendering of "Bonaparte," the object of the game being to pen him up. The name *ma-nu*, "bird," is explained by the moves of the stick. Andrews gives *le-le-pu-ni*, "a kind of play with white and black stones on a board," probably referring to this game.

88. *Hu-ki-la-au*: STICK-DRAWING, DRAWING-STRAWS.—One player prepares two slips of wood of uneven length, and the others draw. If the drawer gets the long piece, he wins; if the short piece, he loses.

89. *Pau-nau-we*: JACKSTRAWS.—Some twenty-five or thirty small splints (*la-au*) are allowed to fall in a heap, and the players endeavor to separate them one by one without moving the others. The name means "to divide into parcels or parts."

90. *Ko-ho-ko-ho-pu-aa*: "PIG-GUESSING."—This is a kind of lottery. The principal stake consists of pigs (*pu-aa*). One hundred cards are prepared, on which are written the names of various articles of food, as pig, fowl, banana, bread-fruit, orange, eggs, etc. Twenty persons each draw a card, the object being to get the one marked "pig." If this is not drawn the first time, the drawing is repeated until some one gets it. This lottery is held on a holiday. The prizes are offered by some rich person. The winner gets five pigs. Afterward the assembled company eats the other food that has been provided.

91. *Pe-pa-ha-kau*: CARDS.—Foreign playing-cards are used. Poker is a favorite game. Five cards are dealt around and the highest hand wins. A player not getting a pair is out of the game. *Pe-pa*, "cards," is the English "paper." *Ha-kau* means "fighting."

LIST OF GAMES

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|----|--|----|---|
| 1 | <i>Ko-wa-li</i> , Jumping-rope. | 26 | <i>Hee-ho-lu-a</i> , Sledge-sliding. |
| 2 | <i>Le-le-ko-a-li</i> , Swinging. | 27 | <i>Ku-ku-lu-a-e-o</i> , Stilts. |
| 3 | <i>Ma-hi-hi</i> , See-saw. | 28 | <i>Pai-pai-li-ma</i> , Hand-clapping. |
| 4 | <i>Ho-lo-li-o</i> , Horse-riding. | 29 | <i>Ku-hi-ku-hi-ma-ka</i> , Eye-pointing. |
| 5 | <i>Ku-al-a-poo</i> , Head-standing. | 30 | <i>Ku-hi-la-au</i> , Wood-pointing. |
| 6 | <i>Pe-le-fe-le</i> , Boxing. | 31 | <i>O-lo-lo</i> , Rubbing. |
| 7 | <i>Ka-ka-pa-hi</i> , Fencing. | 32 | <i>Hu-i-la-ma-ka-ni</i> . |
| 8 | <i>Ku-la-ku-lai</i> , Wrestling. | 33 | <i>O-le-ha</i> . |
| 9 | <i>U-ma</i> , Wrist-wrestling. | 34 | <i>Ha-ka mo-a</i> , Cock-fighting. |
| 10 | <i>U-lu-mi-i-lo-hoo-ke kai</i> , Wrestling in the sea. | 35 | <i>Ho-pu-ho-pu-na-lo</i> , Dragonfly-catching. |
| 11 | <i>Hu-ki-hu-ki-kau-la</i> , Rope-pulling. | 36 | <i>Le-le-pi-nau</i> , Dragonfly-flying. |
| 12 | <i>Hu-ki-hu-ki-a-i</i> , Neck-pulling. | 37 | <i>Au-waa-lau-ki</i> , Leaf-canoes. |
| 13 | <i>Hu-ki-hu-ki-li-ma</i> , Finger-pulling. | 38 | <i>Kii-pe-pe</i> , Dolls. |
| 14 | <i>Hei-hei-ku-ki-ni</i> , Foot-racing. | 39 | <i>Pe-pa pa-a-ni</i> , Paper play. |
| 15 | <i>Hei-hei-haa-we</i> , Burden-racing. | 40 | <i>Po-ka-kaa</i> , Buzz. |
| 16 | <i>Hei-hei-e-ke</i> , Sack-racing. | 41 | <i>O-e-o-e</i> , Bullroarer. |
| 17 | <i>Le-le-wa-wae-ka-hi</i> , One-foot jumping. | 42 | <i>Hu-i-la-ma-ka-ni</i> , Wind-wheel. |
| 18 | <i>Le-le-le-la-au</i> , Stick-jumping. | 43 | <i>Hu-o-e-o-e</i> , Humming-tops. |
| 19 | <i>Hei-hei-ku-i-la-ba-la-la</i> , Wheelbarrow racing. | 44 | <i>Hu-ko-a</i> , Wooden tops. |
| 20 | <i>Hei-hei-au</i> , Swimming race. | 45 | <i>Ha-no</i> , Squirt-gun. |
| 21 | <i>Hei-hei-waa</i> , Canoe-racing. | 46 | <i>Hu-a ko-pa</i> , Soap-bubbles. |
| 22 | <i>Hei-hei-ka-pu</i> , Tub-racing. | 47 | <i>Hei</i> , Cai's-cradle. |
| 23 | <i>Hei-hei-na-lu</i> , Surf-racing. | 48 | <i>Pu-la-au</i> , Wood-puzzle. |
| 24 | <i>Le-le-ka-wa</i> , Precipice-jumping. | 49 | <i>O-ki-kau-la</i> , String-cutting. |
| 25 | <i>O-i-li-pu-le-lo</i> . | 50 | <i>Pu-kau-la</i> . |
| | | 51 | <i>Lu-pe</i> , Kites. |
| | | 52 | <i>Hoo-lei-po-po</i> , Cup and ball. |
| | | 53 | <i>Ku-he-le-mai</i> . |
| | | 54 | <i>Nou-nou-pu-ni-u</i> , Coconut-shell-casting. |

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|----|--|----|--|
| 55 | <i>Ki-ni-ho-lo</i> , Ball. | 72 | <i>Pa-na-i-o-le</i> , Mice-shooting. |
| 56 | <i>Pe-ku-ki-ni-po-po</i> , Ball-kick-
ing. | 73 | <i>Mo-ko-mo-ko</i> . |
| 57 | <i>Pa-na-pa-na-lu-a</i> , Pit-shoot-
ing. | 74 | <i>Ke-a-pu-a</i> , Arrow-throwing. |
| 58 | <i>Ki-o-la-o-la</i> . | 75 | <i>Pa-hee</i> . |
| 59 | <i>Ki-mo-ki-mo</i> , Jackstones. | 76 | <i>Mo-a</i> . |
| 60 | <i>Pi-li-ka-la</i> , Coin-betting. | 77 | <i>Ka-hu-a-ko-i</i> . |
| 61 | <i>Pa-na-pa-na-hu-a</i> , Seed-
shooting. | 78 | <i>Mai-ka</i> . |
| 62 | <i>Ki-o-la-o-la-la-au</i> , Stick-cast-
ing. | 79 | <i>Ki-lu</i> . |
| 63 | <i>Ki-no-a</i> , Hop-scotch. | 80 | <i>Ki-o-la-o-la-le-na</i> , Ring-cast-
ing. |
| 64 | <i>He-lu-pa-ka-hi</i> , One-by-one-
counting. | 81 | <i>Pu-he-ne-he-ne</i> . |
| 65 | <i>Pi-li-li-ma</i> , Hand-betting. | 82 | <i>Ko-ho-ko-ho-pu-ni-u</i> , Cocoa-
nut shell guessing. |
| 66 | <i>Pee-pee-a-ku-a</i> , Ghost-hiding ;
Hide-and-seek. | 83 | <i>Hu-na po-ha-ku</i> , Stone-hid-
ing. |
| 67 | <i>He-lu-pa-a-ni</i> , Play-counting. | 84 | <i>Lu-lu</i> . |
| 68 | <i>Pla-pi-o</i> , Prisoner's play. | 85 | <i>Ko-na-ne</i> . |
| 69 | <i>Ho-lo-pee-a-na-lo</i> . | 86 | <i>Moo</i> , Draughts. |
| 70 | <i>Po-ai-pu-ni</i> , Blind-man's-buff. | 87 | <i>Ma-nu</i> , Fox and geese. |
| 71 | <i>Pa-a-ni a-lu a-lu</i> , Prisoner's
base. | 88 | <i>Hu-ki-la-au</i> , Stick-drawing. |
| | | 89 | <i>Pau-nau-we</i> , Jackstraws. |
| | | 90 | <i>Ko-ho-ko-ho-pu-aa</i> , Pig-guess-
ing. |
| | | 91 | <i>Pe-pa-ha-kau</i> , Cards. |

AN ANOMALOUS ULNA—SUPRA-CAPITAL FORAMEN

By ALEŠ HRDLIČKA

The bone here described was found by the writer in a burial cave in the Sierra Madre, in Chihuahua, Mexico.¹ This large *cueva de los muertos*, which was made by river action in very ancient time, is situated about four miles southwestward from Guachochic, a place consisting of only a single rancho, the seat of the local *gobernador* of the Tarahumare Indians. It is a long day's journey by muleback to the southwest of the town of Carichic, which latter place is two days' *diligencia* journey west of the city of Chihuahua.

The cave is situated in the picturesque valley of the Arroyo de las Iglesias. It is a very large, widely open cavern, which, when I visited it, contained numberless human bones, both fragmentary and entire, partly covered with stones or earth, partly lying on the surface. A tradition is current that the cave was once full of mummified bodies; but the saltpeter digger came, perhaps also the hunter for buried gold, and, aided by rats and other animals, the mummies were dissociated and the bones strewn about. Then came the superstitious Indian from the neighborhood, who so dreads the harmful *muertos* that he cannot sleep in their neighborhood at night, hearing them singing and dancing, and he threw piles of stones on the bones until they were either broken or buried from sight. These facts have such a bearing on the specimens which I am to describe, that I was unable to obtain any other part of the skeleton to which the anomalous ulna belonged, and therefore cannot say whether the

¹ On the Humboldt-Hrdlička Expedition to Mexico under the Auspices of the American Museum of Natural History: New York, March-July, 1898.



AN ANOMALOUS ULNA—SUPRA-CAPITAL FORAMEN

anomaly was unilateral or bilateral, or what irregularities of structure, if any, were shown by other parts of the skeleton.

The ethnological nature of the bones occurring in the cave mentioned is not yet fully determined. Undoubtedly the burial place is a very old one, for many of the bones, even those which were still buried deeply in the earth and could not have been denuded by animals, do not show even a trace of the dry, tough, mummified tissues which for centuries cling to bones in similar locations. However, the whole surrounding country is, and was, so far as any data or traditions go, occupied by the same tribe of Indians—the Tarahumare—hence in all probability the bones belong to the ancestors of these people.

The ulna here described lay bare on the nitrous earth, and attracted my attention by a peculiar large foramen situated just above its inferior extremity. The bone is apparently that of a male; it shows pronounced curvatures, as do many of the Indian *ulnæ*; it is strong, though not excessively so, and up to its head and neck it is entirely normal.

The carpal extremity of the bone shows the following conditions: The styloid process is short; the articular facet on the head, which is usually more or less semilunar in shape with the concavity toward the styloid process, is in this case irregularly circular, with the lateral width greater than the antero-posterior. A few millimetres below the head is situated a well developed, regular, spacious foramen in the bone. The foramen measures 8 mm. in height by 6 mm. in width; its base and internal side rest on the head and the neck of the ulna, while externally the opening is completed by a span of bone 2 mm. thick and 4 mm. broad in its narrowest part. The bone of the span is entirely normal; the proximal extremity of the bridge is continuous with the shaft of the bone and the interosseous ridge, respectively; while the distal extremity of the bridge, widening considerably, blends imperceptibly with the head of the ulna. There is absolutely no sign of any injury on the lower portion of the ulna.

There are no pronounced indications as to what function the anomalous foramen may have served. The inner walls of the opening are smooth; internally on the shaft there are a low vertical ridge and a parallel shallow depression, as well as numerous small foramina for blood-vessels. The borders of the opening are quite smooth. The surrounding bone shows no trace of any groove or depression.

The interpretation of a large, well developed foramen in such a situation is difficult. Three theories suggest themselves as to its function. The foramen may have served for the transmission of an artery, or a tendon may have passed through it, or it may have lodged some sort of benign growth. No one of these theories is without possible objection. The borders of the foramen are hardly as smooth as they would be had they transmitted some erratic tendon or artery, and outside of its borders there is no trace of any groove such as a large artery or a tendon would produce. As to tumor, there is very little if any excavation or absorption of the walls in the opening, and no thickening of the bone.

The formation must have taken place very early in the life of the individual, as the form of the entire head of the ulna is affected. In all probability the anomaly of the foramen is due to congenital causes.

THE WINTER SOLSTICE ALTARS AT HANO PUEBLO

By J. WALTER FEWKES

INTRODUCTION

The fetishes displayed in their kivas by different phratries during the Winter Solstice ceremony at the Hopi pueblo of Walpi, in northeastern Arizona, have been described in a previous article,¹ in which the altar made in the *Moñkiva*, or "chief" ceremonial chamber, by the *Patki* and related people has been given special attention. The author had hoped in 1898² to supplement this description by an exhaustive study of the Winter Solstice ceremonies of all the families of the East Mesa, but was prevented from so doing by the breaking out of an epidemic. This study was begun with fair results, and before withdrawing from the kivas he was able to make a few observations on certain altars at Hano which had escaped him in the preceding year.

Walpi, commonly called by the natives *Hopiki*, "Hopi pueblo," began its history as a settlement of Snake clans which had united with the Bear phratry. From time to time this settlement grew in size by the addition of the *Ala*, *Pakab*, *Patki*, and other phratries of lesser importance. Among important increments in modern times may be mentioned several clans of Tanoan ancestry, as the *Asa*, *Honani*, and the like. These have all been assimilated, having lost their identity as distinct peoples and become an integral part of the population of Walpi, or of its colony, Sitcomovi.³ Among the most recent arrivals in Tusayan

¹ *The Winter Solstice Ceremony at Walpi* (*American Anthropologist*, vol. XI).

² These studies were made under the auspices of the Bureau of American Ethnology.

³ Most of the people of Sitcomovi are of the *Asa* and *Honani* clans, of Tanoan ancestry, but they long ago lost the Tewa language and their Tanoan identity.

was another group of Tanoan clans which will be considered in this article. The last mentioned are now domiciled in a pueblo of their own called Hano; they have not yet, as the others, lost their language nor been merged into the Hopi people, but still preserve intact many of their ancient customs.

The present relations of Hano to Walpi are in some respects not unlike those which have existed in the past between incoming clans and Walpi as each new colony entered the Tusayan territory. Thus, after the *Patki* people settled at the pueblo called Pakatcomo,¹ within sight of Old Walpi, they lived there for some time, observing their own rites and possibly speaking a different language much as the people of Hano do today. In the course of time, however, the population of the *Patki* pueblo was united with the preëxisting Walpi families, Pakatcomo was abandoned, and its speech and ritual merged into those of Walpi. Could we have studied the *Patki* people when they lived at their former homes, Pakatcomo or Homolobi, we would be able to arrive at more exact ideas of their peculiar rites and altars than is now possible. Hano has never been absorbed by Walpi as the *Patki* pueblos were, and the altars herein described still preserve their true Tanoan characteristics. These altars are interesting because made in a Tanoan pueblo by Tewa clans which are intrusive in the Hopi country, and are especially instructive because it is held by their priests that like altars are or were made in midwinter rites by their kindred now dwelling along the Rio Grande in New Mexico.

The midwinter rite in which the altars are employed is called *Táñtai* by the Tewa, who likewise designate it by the Hopi name *Soyaluña*. This latter term may be regarded as a general one applied to the assemblages of different families in all the kivas of the East Mesa at that time. The name of the Tewa rite is a

¹ The site of this last settlement of the *Patki* people, before they joined those of Walpi, is in the plain about four miles south of the East Mesa. The ruins of the pueblo are still visible, and the foundation walls can readily be traced.

special one, and possibly the other families who assemble at this time once had or still retain their own names for their celebrations. The *Táhtai* altars were brought by the ancestors of the present people of Hano from their old eastern home, and the rites about them are distinctly Tewan, although celebrated at the same time as the Winter Solstice ceremonies of the Hopi families.

CLAN COMPOSITION OF HANO

The pueblo called Hano is one of three villages on the East Mesa of Tusayan and contained, according to the writer's census of 1893, a population of 163 persons. It was settled between the years 1700 and 1710 by people from Tcewadi, a pueblo situated near Peña Blanca on the Rio Grande in New Mexico. Although only six persons of pure Tanoan ancestry are now living at Hano, the inhabitants still speak the Tewa dialect and claim as kindred the peoples of San Juan, Santa Clara, San Ildefonso, Pojoaque, Nambe, and Tesuque.¹ The best traditionists declare that their ancestors were invited to leave their old home, Tcewadi, by the Snake chief of Walpi, who was then pueblo chief of that village. They claim that they made their long journey to give aid against the Ute Indians who were raiding the Hopi, and that they responded after four consecutive invitations. The Walpi Snake chief sent them an embassy bearing prayer-sticks as offerings, and although they had refused three invitations they accepted the fourth.

According to traditions the following clans have lived in Hano, but it is not stated that all went to the East Mesa together from Tcewadi: *Okutuñ*, Rain-cloud; *Sa*, Tobacco; *Kolon*, Corn; *Tenyúk*, Pine; *Katcina*, Katcina; *Nañ*, Sand; *Kopeeli*, Pink Shell; *Koyanwi*, Turquoise; *Kapolo*, Crane; *Tuñ*, Sun; *Ki*,

¹ The Hano names of these pueblos are—San Juan, —; Santa Clara, *Ka'a*; San Ildefonso, *Peculíwa*; Pojoaque, *Pokwade*; Nambe, *Náma*; Tesuque, *Tetugi*. They also claim Taos (*Tawité*) and Picuris (*Okhé*), but say that another speech is mixed with theirs in these pueblos.

Bear; *Te*, Cottonwood; *Tayek* (?); *Pe*, Firewood; and *Tceta*, Bivalve shell.

The early chiefs whose names have been obtained are Mapibi of the *Nañ-towa*, Potañ of the *Ke-towa*, and Talekweñ and Kepo of the *Kolon-towa*. The present village chief is Anote of the *Sa-towa* or Tobacco clan.¹

Of the original clans which at some time have been with the Hano people, the following have now become extinct: *Kopeeli*, *Koyanwi*, *Kapolo*, *Tuñ*, *Tayek*, *Pe*,² and *Tceta*. The last member of the *Tuñ* or Sun people was old chief Kalacai who died about four years ago. It is quite probable that several of these extinct clans did not start from Tcewadi with the others. There were several waves of Tanoan emigrants from the Rio Grande region which went to Tusayan about the same time, among which may be mentioned the *Asa*, which took a more southerly route, via Zuñi. The route of the *Asa* people will be considered in another article, and the evidences that some of the *Asa* clans joined their kindred on their advent into Tusayan will be developed later. Probably certain members of the *Katcina* clan accompanied the *Asa* people as far as the Awatobi mesa and then affiliated with the early Hano clans.³

The census of Hano in December, 1898, was as follows:

¹ The Tewa of Hano call the Hopi *Keso*, and the Hopi speak of the Hano people as the *Towa* or the *Hanum-mýámá*. The word "Moki," so constantly used by white people to designate the Hopi, is never applied by the Hopi to themselves, and they strongly object to it. The dead are said to be *maki*, which enters into the formation of verbs, as *tionmaki*, to starve; *kinmaki*, to be very lonesome, etc. The name *Hano* or *Hanóki* is, I believe, simply a combination of the words *Hano* and *ki*, "eastern pueblo." The element *hano* appears also in the designation for American, *Pahano*, "eastern water"; *pahanoki*, "American house." Both the *Asa* and the Tewa peoples are called *Hanum* clans.

² Remains of old reservoirs, elaborately walled, from which water was drawn by means of a gourd tied to a long pole, are still pointed out near Tukinovi and are said to have belonged to the *Pe-towa*. Old Tcasra claims that they were in use in his mother's grandmother's time.

³ The troubles following the great rebellion of 1680 drove many Tewa from the Rio Grande valley to Tusayan.

Clans	Males		Females		Total
Okuwuñ.....	12	....	8	....	20
Sa.....	8	....	5	....	13
Kolon.....	11	....	12	....	23
Tenyitk.....	12	....	16	....	28
Ke.....	5	....	10	....	15
Katcina.....	8	....	9	....	17
Te.....	5	....	4	....	9
Nañ.....	4	....	7	....	11

Total native to Hano domiciled at home... 136

The above enumeration of Hano population does not include Walpi and Sitcomovi men married to Hano women (23), nor Tewa men living in the neighboring pueblos (15).¹ Adding these, the population is increased to 174, which may be called the actual enumeration at the close of 1898. Subsequent mortality due to smallpox and whooping-cough will reduce the number below 160.

In the following lists there are arranged, under their respective clans, the names of all the known inhabitants of Hano. There have been several deaths since the lists were made (December 1, 1898), and several births which also are not included. It will be noted that the majority have Tanoan names, but there are several with names of Hopi origin, for in these latter instances I was unable to obtain any other.²

Census of Hano by Clans

Okuwuñ-towa, or Rain-cloud clan.—Men and boys: Kalakwai, Kala, Tcūa, Wiwela, Kahe, Yane, Solo, Yunci, Pade, Klee, Kochayna, Kēe (12). Women and girls: Sikyumka, Kwentce,

¹ It is impossible to make this enumeration accurate, hence these numbers must be regarded as approximations.

² It is not unusual to find several names applied to the same person. Thus, Hani, the chief of the *Piñu* clans at Walpi, is called Lesma in the Snake kiva. The Walpi call the author Nakwipi, but the Flute chief at Cipaulovi insists that his name is Yoyowaiamū, which appellation was given when the author was inducted into the Flute rites at that pueblo in 1891.

Talitsche, Yoyowaiolo, Pobitcanwû, Yoanuche, Asou, Tawamana (8). Total, 20.

Sa-towa, or Tobacco clan.—Men and boys: Anote, Asena, Temê, Ipwantiwa, Howila, Nuci, Yauma, Satee (8). Women and girls: Okañ, Heli, Kotu, Kwañ, Mota (5). Total, 13.

Kolon-towa, or Corn clan.—Men and boys: Polakka, Patuñtupi, Akoñtcowu, Komaletiwa, Agaiyo, Tcidê, Oba, Toto, Peke, Kelo, Tasce (11). Women and girls: Kotcaka, Talikwia, Nampio, Kweñtcowû, Heele, Pelé, Kontce, Koompipi, Chaiwû, Kweckatcañwû, Awatcomwû, Antce (12). Total, 23.

Tinyûk-towa, or Pine clan.—Men and boys: Tawa, Nato, Wako, Paoba, Topi, Yota, Pobinelli, Yeva, Tañe, Lelo, Sennele, Poctce (12). Women and girls: Toñlo, Hokona, Kode(?), Sakpede, Nebenne, Tabowûqti, Pohê, Saliko, Eye, Porkuñ, Pehta, Hekpobi, Setale, Naici, Kacine, Tcenlapobi (16). Total, 28.

Ke-towa, or Bear clan.—Men and boys: Mepi, Tac, Tcakwaina, Poliella, Tegi (5). Women and girls: Kauñ, Kalaie, Pene, Tcetcuñ, Kala, Katcinmana, Selapi, Tolo, Pokona, Kode (10). Total 15. Tcaper ("Tom Sawyer") may be enrolled in this or the preceding family. He is a Paiute, without kin in Hano, and was sold when a boy as a slave by his father. His sisters were sold to the Navaho at the same time. Tcaper became the property of an Oraibi, later of a Tewa man, now dead, and so far as can be learned is the only Paiute now living at Hano.

Kacina-towa.—Men and boys: Kwevehoya, Taci, Avaiyo, Poya, Oyi, Wehe, Sibentima, Tawahonima (8). Women and girls: Okotce, Kwenka, Awe, Peñaiyo, Peñ, Poñ, Tcao, Poschauwû, Sawiyû (9). Total, 17.

Te-towa, or Cottonwood clan. Men and boys: Sania, Kuyapi, Okuapin, Ponyin, Pebihoya (5). Women and girls: Yunne, Pobitche, Poitzuñ, Kalazañ (4). Total, 9.

Nañ-towa, or Sand clan.—Men and boys: Puñsauwi, Pocine, Talumtiwa, Cia (4). Women and girls: Pocillipobi, Talabensi, Humhebuima, Kac, Avatca, "Nancy," Simana (7). Total, 11.

The present families in Hano are so distributed that the oldest part of the pueblo is situated at the head of the trail east of the *Moñkina*. This is still owned and inhabited by the *Sa*, *Kolon*, and *Ke* clans, all of which probably came from Tcewadi. The *Katcina* and related *Tenyūk*, as well as the *Okuwuñ* and related *Nañ* clans, are said, by some traditions, to have joined the Tewa colonists after they reached the Hopi mesas, and the position of their houses in respect to the main house-cluster favors that theory. Other traditions say that the first pueblo chief of the Tewa was chief of the *Nañ-towa*. Too much faith should not be put in this statement, notwithstanding the chief of the *Tewakiva* belongs to the *Nañ-towa*. It seems more probable that the *Ke* or Bear clan was the leading one in early times, and that its chief was also *kimoñwi* or governor of the first settlement at the foot of the mesa.

Tewa Legends

According to one authority (Kalakwai) the route of migration of the Hano clans from their ancient home, Tcewadi, led them first to Jemesi (Jemez), where they rested a year. From Jemesi they went to Orpinpo or Pawikpa ("Duck water"). Thence they proceeded to Kepo, or Bear spring, the present Fort Wingate, and from this place they continued to the site of Fort Defiance, thence to Wukopakabi or Pueblo Ganado. Continuing their migration they entered Puñci, or Keam's canyon, and traversing its entire length, arrived at Isba, or Coyote spring, near the present trail of the East Mesa, where they built their pueblo. This settlement (Kohti) was along the foot-hills to the left of the spring, near a large yellow rock or cliff called Sikyaowatcomo ("Yellow-rock mound"). There they lived for some time, as the debris and ground-plan of their building attest. Their pueblo was a large one, and it was conveniently near a spring called Unba, now filled up, and Isba, still used by the Hano people.

Shortly after their arrival Ute warriors made a new foray on

the Hopi pueblos, and swarmed into the valley north of Wala,¹ capturing many sheep which they drove to the hills north of the mesa.² The Tewa attacked them at that place, and the Ute warriors killed all the sheep which they had captured, making a protecting rampart of their carcasses. On this account the place is now called Sikwitukwi ("Meat pinnacle"). The Tewa killed all but two of their opponents who were taken captives and sent home with the message that the Bears had come, and if any of their tribe ever returned as hostiles they would all be killed. From that time Ute invasions ceased.

According to another good authority in Tewa lore, the *Asa* people left "Kaekibi," near Abiquiu, in northern New Mexico, about the time the other Tewa left Tcewadi. They traveled together rapidly for some time, but separated at Laguna, the *Asa* taking the southern route, via Zuni. The Tewa clans arrived first (?) at Tusayan and waited for the *Asa* in the sand-hills near Isba. Both groups, according to this authority, took part in the Ute fight at Sikwitukwi, and when they returned the village chief of Walpi gave the *Asa* people for their habitation that portion of the mesa top northeast of the *Tewakiva*, while the present site of Hano was assigned to the Tewa clans. During a famine the *Asa* moved to Túbka (Canyon Tsegi, or "Chelly"), where they planted the peach trees that are still to be seen. The ruined walls east of Hano are a remnant of the pueblo abandoned by them. The *Asa* intermarried with the Navaho and lost their language. When they returned to the East Mesa the Hopi assigned to them for their houses that part of Walpi at the head of the stairway trail on condition that they would defend it."³

¹ The gap in the East Mesa just at the head of the trail before one enters Hano. The pueblo of Walpi derived its name from this gap.

² Their nomadic enemies raided so near the pueblo of the East Mesa that the priests were unable to visit their shrines without danger. The idol of *Talutumsí*, used in the New-fire ceremony, was removed from its shrine north of Wala on that account.

³ Later, as the outcome of a petty quarrel near the middle of the eighteenth century, the *Asa* women moved to Sitcomovi which they founded. At present there is only one woman of this clan in Walpi, and no women of the *Honani*, both of which clans are strong in Sitcomovi.

In view of the tenacity with which the women of Hano have clung to their language, even when married to Hopi men, it seems strange that the *Asa* lost their native dialect during the short time they lived in Tsegi canyon; but the *Asa* men may have married Navaho women, and the Tanoan tongues become lost in that way, the *Asa* women being in the minority. There is such uniformity in all the legends that the *Asa* were Tanoan people, that we can hardly doubt their truth, whatever explanation may be given of how the *Asa* lost their former idiom.

In 1782 Morfi described Hano,¹ under the name "Tanos," as a pueblo of one hundred and ten families, with a central plaza and streets. He noted the difference of idiom between it and Walpi. If Morfi's census be correct, the pueblo has diminished in population since his time. Since 1782 Hano has probably never been deserted, although its population has several times been considerably reduced by epidemics.

In return for their aid in driving the Ute warriors from the country, the Hopi chief gave the Tewa all the land in the two valleys on each side of the mesa, north and east of a line drawn at right angles to *Wala*, the Gap. This line of demarcation is recognized by the Tewa, although some of them claim that the Hopi have land-holdings in their territory. The line of division is carefully observed in the building of new houses in the foothills, for the Hopi families build west of the line, the Tewa people east of it.

DIFFERENCES IN SOCIAL CUSTOMS

A casual visitor to the East Mesa would not notice any difference between the people of Hano and those of Walpi, and in fact many Walpi men have married Tanoan women and live in their village. The difference of idiom, however, is immediately noticeable, and seems destined to persist. Almost every inhabitant of Hano speaks Hopi, but no Hopi speaks or understands Tewa.

¹ Ten Broeck in 1852 seems to have been the first writer to adopt the true name, Hano, of the Tewa pueblo on the East Mesa.

While there are Tewa men from Hano in several of the Hopi villages, where they have families, no Tewa woman lives in Walpi. This is of course due to the fact that the matriarchal system exists, and that a girl on marrying lives with her mother or with her clan, while a newly married man goes to the home of his wife's clan to live.

There are differences in marriage and mortuary customs, in the way the women wear their hair,¹ and in other minor matters, but at present the great difference between the Hopi and the Tewa is in their religious ceremonials, which, next to language, are the most persistent features of their tribal life. Hano has a very limited ritual; it celebrates in August a peculiar rite known as *Sumykoli*, or the sun prayer-stick making, as well as the *Tūñtai* midwinter ceremony, the altars of which are described herein. There are also many *kacina* dances which are not different from those performed at Walpi. One group of clown priests, called *Paiakyamā*, is characteristic of Hano. Compared with the elaborate ritual of the Hopi pueblo, that of Hano is poor; but Tewa men are members of most of the religious societies of Walpi, and some of the women take part in the basket dance (*Lalakonti*) and *Mamsrauti*, in that village.

The following Tewa names for months are current at Hano:

January, *Elo-p'o*, "Wooden-cup moon"; refers to the cups, made of wood, used by the *Tekunympliyas* in a ceremonial game.

February, *Kāuton-p'o*, "Singing moon."

¹ One of the differences in custom between Hopi and Tewa women is the method of making their coiffures. Unmarried girls of Walpi and Hano dress their hair in the same manner, with whorls above the ears. Married women have different ways of wearing their hair in the two pueblos. During the wedding ceremonies at Hano the mother of the bride, in the presence of guests, combs her daughter's hair, or that part of it on the front of the scalp, over the face, so that it hangs down like a veil. She ties the hair on the back of the head in two coils, one of which hangs on either side, but the hair before the face she cuts on a level with the chin, beginning at the top of the ears. The hair which remains is too short to be done up in coils, and is simply brushed to one side or the other. Among Hopi married women all the hair is included in the two coils, and the "hang" is absent.

March, *Yepobi-p'o*, "Cactus-flower moon." The element *pobi*,¹ which is so often used in proper names among the Tewa, means flower.

April, *Pañka-p'o*, "Windbreak moon."

May, *Señko-p'o*, "To-plant-secretly moon." This refers to the planting of sweet corn in nooks and crevices, where children may not see it, for the *Nimán-katcina*.

June-October, nameless moons, or the same names as the five winter moons.

November, *Cñi-p'o*,² "Horn moon," possibly referring to the *Aaltá* of the New-Fire ceremony.

December, *Tántai-p'o*, "Winter-solstice moon."

CONTEMPORARY CEREMONIES

The Winter Solstice ceremony is celebrated in Walpi, Sitcomovi, and Hano, by clans, all the men gathering in the kivas of their respective pueblos. The *Soyaluña* is thus a synchronous gathering of all the families who bring their fetishes to the places where they assemble. The kivas or rooms in which they meet, and the clans which assemble therein, are as follows:

Walpi

MOKKIVA: *Patki*, Water-house; *Tabo*, rabbit; *Kúkúte*, Lizard; *Tiwa*, Sand; *Lenya*, Flute; *Piba*, Tobacco; and *Katcina*.

WIKWALLOBIEIVA: *Asa*.

NACABKIVA: *Kokop*, Firewood; *Tcúa*, Snake.

ALKIVA: *Ala*, Horn.

TCIVATOKIVA: *Pakab*, Reed; *Honan*, Bear.

Sitcomovi

FIRST KIVA: *Patki*, Water-house; *Honani*, Badger.

SECOND KIVA: *Asa*.

¹ The names of many Tewa women end in *pobi*, corresponding with the Hopi *ñi*, a contracted form of *ñihá*, in women's names, as *Hohñi*, *Nasñumñi*, etc.

² Among the Hopi the moon (Tewa *p'o*) is called *máiyáñh*; new moon, *máiyá-katei*; first quarter, *máiyáchaunacapti*; full moon, *máiyáunacapti*. An eclipse of the moon is spoken of as *máiyáñh maki*, "dead moon." There was a total eclipse of the moon visible at Walpi near the end of December, 1898, when the full moon arose partially obscured. This, said Sikyatala, was bad for the Americans who dwell in the far east, but not for the Hopi. A "dead moon," when in the meridian of the Hopi pueblos, is considered *kalolamai*, "bad."

Hano

MOŠKIVA : *Sa*, Tobacco ; *Kc*, Bear ; *Kolon*, Corn, etc.

TEWAKIVA : *Nañ*, Sand ; *Okwuwñ*, Rain-cloud, etc.

The altars or fetishes in the five Walpi kivas are as follows :

The altar described in a former publication¹ is the most elaborate of all the Winter Solstice fetishes at Walpi, and belongs to the *Patki* and related clans.

The *Asa* family in the *Wikwaliobikiva* had no altar, but the following fetishes : (1) An ancient mask resembling that of *Natacka* and called *tcakwaina*,² attached to which is a wooden crook and a rattle ; (2) an ancient bandoleer (*tosriki*) ; and (3) several stone images of animals. The shield which the *Asa* carried before the *Moñkiva* altar had a star painted upon it.

The *Kokop* and *Tcūa* families, in the *Nacabkiva*, had no altar, but on the floor of the kiva there was a stone image which was said to have come from the ancient pueblo of Sikyatki, a former village of the *Kokop* people.

There was no altar in the *Alkiva*, but the *Ala* (Horn) clan which met there had a stone image of Pūdkonhoya, and on the shield which they used in the *Moñkiva* there was a picture of Alosaka.

The *Pakab*³ (Reed or Arrow) people had an altar in the *Tcivatokiva* where Pautiwa presided with the *tīponi* or palladium of that family.

¹ *The Winter Solstice Ceremony at Walpi*, op. cit.

² The *Asa* people are also called the *Tcakwaina* clans. The ruins of their old village, near the western point of Awatohi mesa, are called Tcakwaina-ki. Its walls do not appear above the surface.

³ The particular ceremony of the *Pakab* peoples is the *Momwita*, a single day's rite which occurs just after the *Syafutia*, under direction of Pautiwa. Connected with this ceremony are the performances of the "stick swallowers" or *Nacab* priests who were thought to be extinct at Walpi, but Eewa is chief of the *Nocutano* priests, and the society includes Wikyatiwa, Talahoya, Sikyaventima, and others. They still practice stick-swallowing. Pautiwa is chief of the *Kaliktaka*, a warrior priesthood. He belongs to the Eagle clan of the *Pakab* phratry, which may be related to the *Awata* or Bow clan of the former pueblo of Awatohi.

The writer was unable to examine the fetishes of the *Honani* and *Asa* clans, who met in the two Sitcomovi kivas. It was reported that they have no altars in the *Soyaluña*, but a study of their fetishes will shed important light on the nature of the rites introduced into Tusayan by these clans. Tcoshoniwa is chief in one of these kivas.¹

Pocine, chief of the *Tiwakiva*, belongs to the *Nañ-towa*, or Sand clan, and is the elder son of Pocilipobi. Pufisauwi, his uncle, is Pocilipobi's brother. As the *kimoñwi* or village chief of the Tewa colonists, when they came into Tusayan, belonged to the Sand clan, we may suppose this altar to be hereditary in this family.

Anote, the chief of the *Moñkiva* of Hano, is the oldest man of the *Sa-towa* or Tobacco clan. Satele, who assisted him in making the altar, is a member of the *Ke* or Bear clan. Patuñtupi, who was present when the altar was made at Hano, belongs to the *Kolon* or Corn clan.

THE WINTER SOLSTICE CEREMONY

The *Tññtai* or *Soyaluña* ceremony of the East Mesa in 1898 extended from December 9th to the 19th inclusive, and the days were designated as follows:

- 9th, *Tcotcoñyuñya* (*Tcotcoñya*), Smoke assembly.
- 10th, *Teele tcalaññh*, Announcement.
- 11th, *Cñs-tala*, First day.
- 12th, *Lac-tala*, Second day.
- 13th, *Paic-tala*, Third day.
- 14th, *Yuñya*, Assemblage.
- 15th, *Sockahimñ*.

¹ Tcoshoniwa is generally called by a nickname, Tcino, "Bald-head," or "Curly-hair," a sobriquet to which he strongly objects. He is one of the oldest men of Sitcomovi, belongs to the *Patti* clan, and was formerly the *kimoñwi* or governor of Sitcomovi. Hani, of the *Piñs* (Tobacco) clan, is political chief of Walpi; and Anote, also of the *Piñs* clan, is chief of Hano. All the pueblos have *kimoñwis* or governors, and the office dates from early times; but these pueblo chiefs have no authority over pueblos other than their own.

- 16th, *Komoktotokya*.
- 17th, *Totokya, Totokpee*.
- 18th, *Pegumnove*.
- 19th, *Navolcine*.

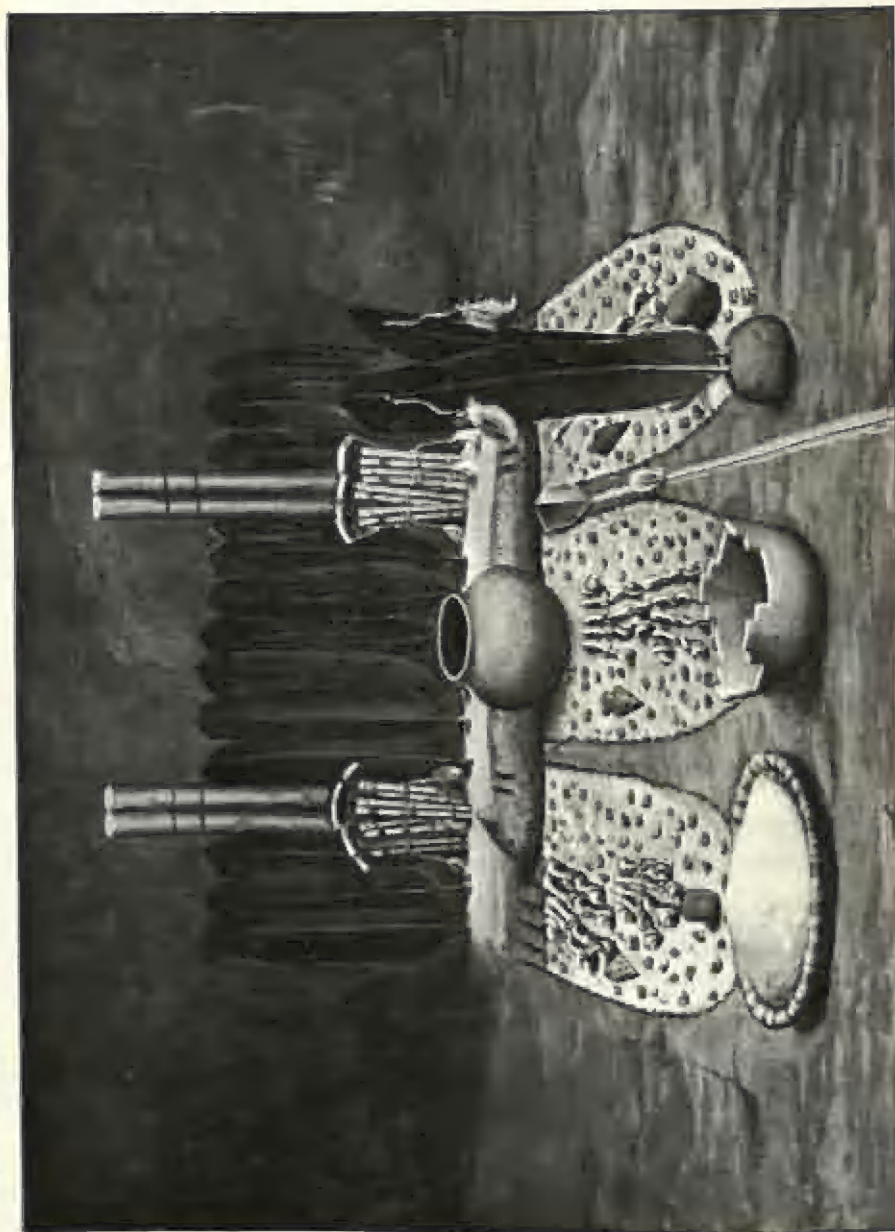
The active secret ceremonies began on the 14th and extended to the 19th. *Yunya* was the day on which the Walpi chiefs entered their kivas, and *Totokya* that on which the most important secret rites were performed.

Tcotcoñyunya, Smoke assembly. The time of the *Soyaluña* is fixed by Kwatcakwa, Sun-priest of the *Patki* clan, who determines the winter solstice by means of observations of sunset on the horizon, as elsewhere described. The Smoke assemblage at Walpi occurred after sunset on December 9th, in the house of Anwuci's wife, adjoining the *Moñkiva*, and was attended by Supela, Kwatcakwa, Sakwistiwa, Kwaa, and Anawita, all chiefs belonging to the *Patki* clan. The Smoke assemblage at Hano, preliminary to the *Tūñtai*, was also held after sunset on December 9th, and was attended by the following chiefs: Anote (*Temé*), *Sa-towa*; Satele, *Ke-towa*; Pocine (*Koye*), *Nañ-towa*; Patuñtupi, *Kolon-towa*.

There was no formal notification of *Tūñtai* from the house-tops of Hano on the following morning, the *Soyaluña* announcement from Walpi serving all three pueblos on the East Mesa.

The formal announcement was made by Kopeli at daybreak of December 10th. Hoñyi, the regular *tcakmoñwi*, or town-crier, was snowbound at Keam's Canyon, and consequently was unable to perform this function.

The Smoke assemblage and its formal announcement at daybreak on the following morning have been observed in the Snake dance, and in the Flute, New-fire, and *Soyaluña* ceremonies; it probably occurs also in the *Lalakoñti* and *Mamrauti*. It takes place several days before the Assembly day, when the chief enters the kiva and sets his *matci* or standard on the kiva hatch to announce that he has begun the ceremonies.



Drawn by MARY M. LEIGHTON

ALTAR IN THE MORAVIA AT HANO

KIVAS AT HANO

There are two kivas in Hano, one of which, called *Tewakiva*, is situated at the head of the trail to the pueblo. The other, called the *Monkiva*, is built in the eastern part of the plaza, and, as its name implies, is the "chief" Hano kiva. Both these semi-subterranean rooms are rectangular¹ in shape, and in structural details resemble the kivas of Walpi. Each has a hatchway entrance in the middle of the roof, and is entered by means of a ladder which rests on the floor near a central fireplace. Neither of the Hano kivas has a window, but each has a raised platform for spectators east of the fireplace.²

ALTAR IN THE MONKIVA AT HANO

Anote,³ the chief of the *Monkiva*, constructed his altar (plate XVIII) on the day above mentioned as *Paictala*. He anticipated the others in making it, and began operations, about 10 A.M., by carefully sweeping the floor. His fetishes and other altar paraphernalia were in a bag on the floor at the western end of his kiva, but there was no *tiponi*, or chieftain's badge, even on the completed altar.

Shortly after Anote had finished sweeping the floor of the kiva, Satele entered, followed a few minutes later by Patuñtupi.⁴ These three men, with Kalakwai, who was weaving a blanket, were the only persons in the kiva while the altar was being made. Immediately after the other chiefs came in, Anote began the making of prayer-sticks. Four of these were made, each of characteristic Tewa form.

Each of these prayer-sticks was double the length of the

¹ The orientation of the Hano kivas is not far from that of the other East Mesa kivas, or about north 44° west.

² The chief kiva had a small stove, an innovation which was greatly appreciated by the writer.

³ So named by the Hopi; the Tewa call him Temé. At Hano almost everyone has a Hopi and a Tewa name.

⁴ Son of Kutve and Kotcampa of the *Kolon-tewa*, or Corn clan; commonly called "Esquash" by Americans.

middle finger, and was painted black with green pigment at the blunt end. On one of the two sticks which compose this prayer offering, there was cut a facet which was painted green with black dots representing eyes and mouth. The stick without the facet was called the male, and upon it a ferrule was incised.

The two sticks were bound together with two cotton strings in two places, but no packet of prayer-meal was appended as in Hopi prayer-sticks (*pahos*).¹ A string with a terminal feather was attached to that which bound the two sticks together. Anote likewise made many feathered strings called *nakwakwocis*, and Satele fashioned two prayer-sticks; all of these were laid in a basket-tray on the floor.

After these prayer offerings had been completed, Anote placed on the floor a blanketful of moist clay which he further moistened and kneaded, fashioning a part of it into a cylinder about a foot and a half long, and two inches in diameter. This object was made blunt at one end and pointed at the other. The image represents *Avaiyo*, the Tewa name of *Palulukoñ*, the Great Serpent. He added to the blunt end, or head, a small clay horn,² and inserted a minute feather in the tip of the tail. He fashioned into a ball the clay that remained after making the effigy of the serpent, patting it into a spherical compact mass about the size of a baseball. This, called the *natei*, later served as the pedestal to hold two eagle-wing feathers, and was placed at the kiva hatch each day to inform the uninitiated that ceremonies were in progress.

Having finished the effigy of the Great Serpent and formed the clay cylinder to his liking, Anote made on the western side of the floor of the kiva a ridge of sand, a few inches high and about

¹ The corn-busk packet of meal seems to be wanting in Zuni, Keresan, and Tanoan prayer-sticks, but it is almost universally present in those of the Hopi. The Tanoan prayer-stick is called *s'dope*.

² A cephalic horn is an essential organ of the Great Snake, and is always represented in pictography and on graven or other images of this being. Note the similarity of his Tewa name to the Spanish word *abajo*, "below."

two feet long, parallel with the western wall. While making this ridge he sat between it and the kiva wall. Having patted this sand ridge to the proper height, he removed from their wrapping of coarse cloth, four sticks, each about two feet long. These sticks, dingy with age, were tied in pairs, and were called *poñya-saka*, "altar ladders." They were inserted in the ridge in pairs, one on each side, and between them was placed in the sand a row of eagle feathers. As these were being put in position by Satele, Anote sang in a low tone, the song continuing as the other parts of the altar were arranged.¹ Anote was frequently obliged to prompt his associate regarding the proper arrangement of the objects on the altar.

Satele next drew a line of prayer-meal before the ridge of sand, and from it, as a base line, made three deep semicircles representing rain-clouds. These were drawn as simple, elongated outlines, but immediately the chief sprinkled meal on the floor over the space enclosed by them. The curved edges of the three rain-cloud symbols were then rimmed with black sand or powdered coal. About twenty short, parallel lines, representing falling rain, were next drawn on the floor with cornmeal, and alternating with them the same number of black lines. Satele then placed upon the rain-cloud symbols, skeleton puma paws, two for each rain-cloud. At the apex of each symbolic cloud a stone fetish of a bear was deposited, and by the side of each an arrow-point or other stone object was laid.

The clay effigy of the Great Snake was next placed back of the rain-cloud symbols, with the head pointing southward. As this effigy lay on the floor, Anote made on it, with meal, representations of eyes and teeth, then drew two lines of meal about the neck for a necklace, and two other parallel lines about the tail. Black powder was then evenly sprinkled along the back of the effigy.

¹ This is the first time songs have been noted while an altar was being put in place.

Both Anote and Satele procured a few ears of differently colored corn and shelled them upon the rain-cloud picture, sprinkling the grains evenly over the meal design, and adding a few to the back of the Great Snake. Squash and melon seeds were likewise distributed in the same way. The vase from which the stone effigies and other images were taken was then placed near the base of the middle rain-cloud picture, and a large quartz crystal was added on the left. A conch, which the author presented to the chief, was placed on the right of this vase. Anote then swept the floor north of the fireplace, and as he sang in a low tone Satele drew a straight line of meal from near the right pole of the ladder across the floor to the middle of the altar. He placed along this line, at intervals, four feathers, and near where it joined the altar he stretched a string, with an attached feather, called the *putabi*.¹ He then sprinkled a line of pollen along this trail of meal.

Anote's medicine-bowl was set just in front of the middle rain-cloud figure; the clay pedestal with inserted upright feathers stood before the left, and a basket-tray with prayer-meal before the right rain-cloud figure.

ALTAR IN THE TEWAKIVA AT HANO

The altar (plate XIX) in the *Tewakiva* was begun about 10 A.M. on the Assembly day, and was made by Pocine,² assisted by his uncle, Puñsauwi, both members of the *Nañ-towa*, or Sand clan.

The preparations began with the manufacture of a clay effigy of the Great Snake similar to but larger than that made by Anote in the *Moñkiva*. The clay was moistened and kneaded on the floor, and then rolled into a cylinder about three feet long, blunt at one end and pointed at the other.

¹ This was a four-stranded string of cotton, as long as the outstretched arm, measured from over the heart to the tip of the longest finger. It is supposed to be a roadway of blessings, and the trail of meal is the pathway along which, in their belief, the benign influences of the altar pass from it to the kiva entrance and to the pueblo.

² Pocine is a youth not far from seventeen years of age. His marriage ceremony was studied by the writer a week before the *Tiditai*.



Drawn by MARY M. LAINGER

ALTAR IN THE TEWAKWA AT HANO

Four clay balls were made at the same time. One of these later served as the base of a standard (*nata*) which was subsequently placed each morning on the kiva hatch to warn the uninitiated not to enter. The other three were placed back of the altar and supported the sticks called the altar-ladders, which will be considered later.

Pocine outlined with meal on the floor a square figure which he divided into two rectangular parts by a line parallel with the northern side. He used meal of two colors—white for one rectangle, and light brown or pinkish for the other. Having made the outlines of the rectangle with great care, he carelessly sprinkled the enclosed spaces with the meal, hardly covering the sand base upon which the figures were drawn. He then added four triangular figures in meal on the south or front side of the rectangular symbols. These images represented rain-clouds, and were alternately white and brown.¹ To the tips of these triangular rain-cloud figures he appended zigzag continuations with lozenge-shaped tips representing the lightning of the four cardinal points. A stone spearpoint or arrowhead was laid on each lozenge-like tip of the zigzag lightning.²

The two men, Pocine and Pufsauwi, next raised the snake effigy and bore it to a position back of the rectangular meal figures on the floor. They deposited it in such a way that its head pointed southward. Having set the snake effigy in the position which it was to retain throughout the ceremony, Pocine sprinkled a black powder along the back of the image, while his uncle inserted several kernels of corn in the blunt end to repre-

¹ The triangle among the Hopi is almost as common a symbol of the rain-cloud as the semicircle. It is a very old symbol, and is frequently found with the same meaning in cliff-houses and in ancient pictography.

² It was found in studying the four lightning symbols on this Tewa altar that sex is associated with cardinal points as in the Walpi Antelope altar. The lightning of the north is male, that of the west female, the south male, and the east female. The same holds with many objects in Hopi altars; thus the stone objects, *hamahia*, of the Antelope altar follow this rule. In the same way plants and herbs have sex (not in the Liunean meaning), and are likewise associated with the cardinal points.

sent the teeth of an upper jaw. Two kernels of corn were then stuck into the head to indicate eyes, and an imitation necklace, also of grains of corn, was made around the neck of the idol. A double encircling row of corn grains was inserted in the tail or pointed end of the effigy, and Pocine added a small feather at the tip.

After the effigy had been put in position and adorned in the manner described, both Pocine and his uncle again shelled ears of corn on the rectangles of meal,¹ to which were added squash, melon, and other seeds. These were regularly distributed, some being dropped along the back of the image.

A row of eagle feathers was now inserted along the back of the effigy, instead of in a ridge of sand as in the *Moñkiva* altar. There were twelve of these feathers, and they were placed at equal intervals from the neck to the tail of the effigy. Puñsauwi then placed the three balls of clay, previously mentioned, back of the image, and in each of these balls he inserted two sticks, called *pahos*, similar to those used on the altar of the *Moñkiva*. These are ancient objects, being reputed to have descended from a remote past. One stick in each pair was called the male, the other the female, as is true of all double prayer-sticks used by the Hopi Indians. They are called *poñya-saka*, "altar-ladders," and imitations² of them in miniature are made and placed in shrines on the final day of the ceremony.

The insertion of the row of eagle-feathers along the back of the clay effigy of the serpent recalls an instructive reptilian figure on one of the bowls from Sikyatki.³ In this ancient pictograph we find a row of triangles drawn along the medial line from the head to the tail of a lizard-like figure. The use of the triangle in ancient Pueblo pictography as a symbol of a wing-

¹ This sprinkling of corn seeds upon the meal picture of a Hopi altar is mentioned in an account of the Oraibi Flute ceremony. The evident purpose of this act is to vitalize the seeds by the accompanying rites about the altar.

² Called *amwadh-saka*, "rain-cloud ladders."

³ *Smithsonian Report*, 1895, pl. lvii.

feather, has been pointed out in an article on the feather as a decorative design in ancient Hopi pottery.¹ The medial line of triangles, representing feathers, on the Sikyatki food-bowl, is paralleled in the Hano kiva by eagle-wing feathers inserted along the middle of the image of a snake.

A small vase was next placed just in advance of the effigy of the Great Snake, and into this vase Pocine poured water from an earthenware canteen, making a pass as he did so to the four Pueblo cardinal points—north, west, south, and east—in sinistral ceremonial circuit.² A stone arrowpoint was then laid on the lozenge-shaped extremity of each lightning figure.

Pocine now scraped into the vase some powder from a soft white stone, saying, as he did so, that the process was called *sotwiyauma*, "rabbits emerge,"³ and that he wished he had stones of other colors, corresponding to the cardinal points, for the same purpose. After this was finished he emptied on the floor, from a cloth bag, a miscellaneous collection of botryoidal stones (many of which were waterworn), a few fetishes, and other objects, one of the most conspicuous among the latter being a large green stone. All were at first distributed on the meal picture without any special order, but later were given a definite arrangement.

Pocine next went up the kiva ladder, and standing on the upper rung in the sunlight, sought, by means of an angular piece of glass, to reflect a ray of sunlight on the altar, but more especially into the vase of medicine. Four turkey-feathers were then inserted at equal intervals along the base of the serpent effigy, as shown in plate XIX.

¹ *The American Anthropologist*, vol. XI, page 1.

² The Tewa, like the Hopi, recognize six ceremonial directions—north, west, south, east, above, and below. The sinistral circuit is one in which the center is on the left hand, while the dextral circuit has its center to the right. The older term, "sunwise," for the latter circuit, etymologically means one ceremonial circuit in the northern hemisphere and an opposite in the southern. On this and other accounts the author has ceased to use it in designating circuits.

³ For the increase of rabbits.

After the stone objects had been arranged on the meal picture, a line of meal was drawn along the floor, from the right pole of the ladder to the altar. This line was drawn with great care, particular pains being taken to make it as straight as possible. There was no singing while this occurred, thus differing from the ceremony performed in the other Hano kiva. Four small feathers were placed at intervals along the line of meal. These, in sequence, beginning with the one nearest the ladder, were *sikyatei*, yellow-bird; *kwahu*, eagle or hawk; *koyoña*, turkey; and *pocineñ*. Pocine sprinkled pollen along this line or meal trail.

There was then emptied from a canvas bag upon the rectangular meal figures a heterogeneous collection of objects, among which may be mentioned a bundle of gaming reeds, the humerus of a turkey, a whistle made of a turkey bone, and a zigzag wooden framework such as is used by the Hopi to represent lightning.¹

Back of the altar, leaning against the wall of the kiva, was set upright a wooden slat, notched on both edges and called *tawa-saka*, "sun-ladder." Miniature imitations (plate xx) of this are made in this kiva on the last day of the *Tūñtai* and deposited in a shrine near Sikyaowatcomo, the site of the early settlement of the Tewa. The *poñya-saka* or *tawa-saka* mentioned has not before been seen in any Hopi ceremony, and it may be characteristic of Tewa altars. A notched prayer-stick, called the rain-cloud ladder, is placed in the same shrine at this time. This is characteristic of the Tewa of Tusayan, but is not found in the Hopi *pahos*, with which I am familiar.²

¹ This zigzag framework had appended to one end a carved imitation of a snake's head, and as it represents the lightning this association was not incongruous. Similar frameworks are carried in the dance by a man impersonating Pūkoñ, the War god, and at certain other times when lightning is symbolized.

² In asking why albino Hopi are found at the Middle Mesa and not on the East Mesa, it was unexpectedly learned that in some ceremonies a white prayer-stick is made at the former mesa, and that albinism was due to want of care by the father in making these offerings while his wife was pregnant. The author has never seen the white *pahos* of the Middle Mesa, and does not know when it is made nor its shape and use.



Drawn by J. L. RIDGWAY

MINIATURE IMITATION OF THE TAWA-SAKA OR SUN-LADDER.

(About one-half size)

The reason these prayer-sticks are termed "ladders" is because they have the form of an ancient type of ladder made by notching a log of wood. They are symbols of the ladders by which the Sun is supposed to emerge from his house at sunrise. In the Hopi and Tewa conception the Sun is weary as he withdraws to the south in winter, and these ladders are made to aid him in rising, and thus in returning to bless them. More light will doubtless be shed on the significance of the sun-ladder prayer-offerings when we know more of the ceremonies about the *Tūñtai* altars.

No *Hiponi* or badge of office was placed on this altar on the day it was made, and my abrupt departure from the East Mesa made it impossible for me to see the rites which are later performed about it.

It is evident, from the preceding description, that the priests of Hano have a knowledge of the Great Serpent cult corresponding to the worship of *Palūlūkoñ*. Among the Hopi the *Patki* people claim to have introduced this cult¹ in comparatively recent times. There is a Tewa clan called *Okuwuñ* (Cloud) which corresponds, so far as meaning goes, with the *Patki* clan of the Hopi. Whether this clan brought with it a knowledge of the Great Snake is not clear, as traditions are silent on that point.

There is a tradition in the *Okuwuñ* clan that their ancestors, like those of the *Patki*, came from the south, and that the *Nañ-towa* bears a like relationship to the *Okuwuñ* that the Hopi *Twa* clan does to the *Patki*.² If this tradition is well founded, a knowledge of the Great Snake fetish of the two Hano kivas may have been brought by the *Okuwuñ* and *Nañ-towa* into Tusayan from the same place as that of *Palūlūkoñ*.

¹ All Hopi priests are very solicitous that sketches of the *Patki* altar in the *Soy-alaña* should not be shown to Tewa men or women; and the Tewa men begged me to keep silent regarding their altars while conversing with the Walpi chiefs. There is a very strict taboo between the two peoples at the time of the Winter Solstice ceremony, which is more rigid than at other times.

² The *Twa* (Sand) or *Kabāci* (Lizard) clan lived at Pakatcomo with the *Patki* people, according to their legends.

The Kwakwantu society of the *Patki* clans among the Hopi are intimately connected with this Great Plumed or Horned Snake cult. In some parts of the New-fire ceremony, in which this society takes a prominent part, each member of the society carries in his hand a small wooden image of a horned snake. These images are called *moñkohus*, some of the typical forms of which are figured in an article on the *Naacnaiya*.¹ The head of the snake and its horn are well represented in several of these wooden effigies.

CONCLUSIONS

The special interest attached to the Winter Solstice altars at Hano is in the fact that they are made by Tewa priests whose ancestors came to Tusayan about the beginning of the eighteenth century. The makers claim that their forefathers brought a knowledge of them from Tcewadi, in the upper valley of the Rio Grande in New Mexico, and that their relatives in the Tewa pueblos in the east still use like altars in their celebration at the *Táñtai*.

Nothing, so far as known, has yet been published on the *Táñtai* altars of the eastern Tanoan people, but ethnographers may yet find in the kivas of those villages material which will render the above descriptions of comparative interest. The resemblance of the *Táñtai* altars to that of the *Patki* and related families in the Walpi *Moñkiva* at the Winter Solstice, is a very distant one. Both have snake effigies, but there is practically little else in common between them, or with the altar erected at the same time by the *Pakab* people in the *Tcivatokiva*. The *Táñtai* altars are characteristically Tewan, and, while homologous with each other, are different from any yet known from the Hopi pueblos.

¹ *Journal of American Folk-lore*, 1893, pl. II, figs. 1-4. These *moñkohus* of the Kwakwantu society, representing horned snakes, should not be confounded with those carried by other societies, typical forms of which are shown in figures 5-8. In the article quoted it was not stated that the effigies with heads represent *Patlakohut*. The effigy on the massive club borne by the chief of the Kwakwanta also represents the Great Snake.

The purport of the *Táñtai* rites at Hano seems to be similar to that of the Hopi *Soyaluña*, namely, to draw back the sun in its southern declination, and to fertilize the corn and other seeds and increase all worldly possessions. As at Walpi, strings with attached feathers are made and given to men and women with wishes that the gods may bring them blessings. These strings are also attached to beams of houses, placed in springs of water, tied to the tails of horses, burros, sheep, dogs, chickens, and indeed every possession which the Indian has and wishes to increase. The presence of the idol of the snake means snake worship.

The survival of the Tanoan *Táñtai* altars at Hano is typical of the way in which the Tusayan ritual has grown to its present complicated form. They are instances of an intrusive element which has not yet been amalgamated, as the knowledge of them is still limited to unassimilated people and clans.

Similar conditions have existed from time to time during the history of the Hopi, when new clans were added to those already existing. For many years incoming clans maintained a strict taboo, and each family held the secrets of its own religion; but as time went on and assimilation resulted by intermarriage, the religious society arose, composed of men and women of different clans. The family to which a majority of the membership belonged continued to hold the chieftaincy, and owned the altar and its paraphernalia, cherishing the legends of the society. But when men of other clans were admitted to membership, a mutual reaction of one society on another naturally resulted. This tended to modifications which have obscured the original character of distinctive family worship.

The problem of the Hopi ritual, by which is meant the sum of all great ceremonies in the Hopi calendar, deals largely with a composite system. It implies, as elsewhere pointed out, an investigation of the characteristic religious observances of several large families which formerly lived apart in different pueblos. It

necessitates a knowledge of the social composition of Walpi and of the history of the different phratries which make up the population of the village.

There is a corollary to the above conclusions. No pueblo in the southwest, outside of Tusayan, has the same ceremonial calendar as Walpi, because the population of none is made up of the same clans united in the same relative proportions. Hence the old remark that what is true of one pueblo is true of all, does not apply to their ritual. Some ceremonies at Jemez, Acoma, Sia, and Zuñi, for instance, are like some ceremonies at Walpi; but the old ceremonial calendar in any one of these pueblos was different from that of the other, because the component families were not the same. In the same way the ceremonies at Hano and Walpi have certain things in common, due no doubt to the assimilation in the latter of certain Tanoan clans, but their calendars are very different. The *Túñtai* at Hano differs more widely from the Winter Solstice ceremony at Walpi, a gunshot away, than the Walpi observance differs from that at Oraibi, twenty miles distant. So we might also predict that if we knew the character of Winter Solstice altars in the Rio Grande Tewa villages, they would be found to resemble those of Hano more closely than the altars of Hano resemble those of Walpi.

THE NANTICOKE INDIANS OF INDIAN RIVER, DELAWARE

BY WILLIAM H. BABCOCK

There are two remnants of Indian population in eastern Delaware, not far from the coast,—the so-called Moors of Kent county and the more southerly Nanticokes on Indian river in Sussex county.

Of the former I can speak by report only, not having visited them. According to an old legend they are the offspring of Moors shipwrecked near Lewes; a more romantic version gives them only one Moorish progenitor—a captive prince who escaped from his floating prison and found wife and home among the half-Indian population alongshore. There are said to be two or three hundred of these people, clustering mainly around Chesholm, a hamlet and railroad station a few miles south of Dover. The *Philadelphia Press* for December 1st, 1895, presents a series of portraits which, if accurate, go far to sustain the contention of the Nanticokes that there is not much in common between the two peoples; but their intercourse is too slight and infrequent for their judgment to be conclusive. They consider the Chesholm people to be a mixture of Delaware Indians with some Moorish or other foreign strain. According to their tradition the Nanticoke and Delaware tribes were often at war in the old time, and even yet there would seem to be a barrier of rather more than indifference between them.

The Nanticokes themselves are not more than fifty or sixty in number at home; that is to say, in the sandy pine-land country which lies between the northeastern shore of Indian river and the coastline, comprising approximately the two county subdivisions

or "hundreds" of Clear spring and Indian river. They have sent out numerous colonies and keep in touch with most of these, so that one may see in their albums prosperous faces from Maine and California. One member of the tribe, lately deceased, attained a considerable measure of wealth in Philadelphia. A whole carload migrated to Michigan a short time before the Rebellion, when circumstances and white neighbors bore over-heavily upon them. Another party, including Levin Sockume, their strongest man, moved to Gloucester, New Jersey. Nearer home, though hardly more accessible, are isolated families on the Pocomoke, near Snow Hill, and across Delaware on the river which bears their own name. These offshoots have for the greater part kept up their rules of life in the matter of racial segregation, except that wherever a single household settled where there were no Indian neighbors, the sons and daughters have generally married with the whites; but where wives and husbands of Nanticoke blood were obtainable, the latter seem to have had the preference.

In the Indian River country, the rule is imperative. There must have been intermarriage with the whites at one time, for they admit that none of them is wholly Indian, while nothing so stirs their indignation as to be suspected of having negro blood; but at present they marry exclusively among themselves. A Nanticoke of either sex who marries among the negroes is referred to as having "gone astray," and although not ill-treated is no longer welcome in church or home or any social gathering. They have their own (Methodist Protestant) church, usually ministered to by a white man, and a school supported wholly by them for their own children only, though they pay taxes abundantly for the public schools besides.

In person they seem to be mainly of medium height and of strong though not very bulky frame. The form of head differs not less than with ourselves, I think, judging solely by the eye. Neither from the individuals before me, nor from the much more

numerous photographs which they exhibited, could I deduce anything like a general rule or type. The craniologist of the future would probably form his idea of the Nanticoke from the particular specimens which might happen to come in his way, and his conclusions would err accordingly.

In complexion there is as marked a variance. There are individuals whiter than many white folk; there are others of all intermediate shades, to the coppery tint which we most often associate with the Indian race. This does not depend on the proportion of Indian blood; the son of a very light-tinted father and mother may be a more pronounced Indian in complexion than half the members of tribal delegations that visit Washington.

My chief informant and kind assistant in my investigations, Mr William Russell Clark, is of notable Nanticoke type—long, glossy, black hair waving about his shoulders; vivid, eager, black eyes; aquiline nose, dark complexion, oval countenance; enterprising, sensitive, spirited, and kindly. But there is another and broader type of countenance among his people which recalls the more Tartar-like and square-faced Indians whom we so often see. In cheek-bones, in lips and nostrils, they have the features of their race, or of the white race, and not those of the African; yet no one of them would be taken for a person of unmixed white blood unless by a careless observer.

I neither saw nor heard of cripples nor seriously diseased persons; yet instances of longevity seemed equally wanting, for their oldest living member is under fourscore years. To divers inquiries concerning young persons or couples, the answer "dead," "he is dead," or "they are both dead," came with depressing regularity. I found that my entertainers agreed with me in not considering themselves a long-lived people.

Children are fairly numerous. I saw no very large families, but the roads were well dotted with them in twos and threes on their way to school. They seemed a hearty, cheery lot of youngsters, not unlike well-treated, well-taught white children of equal

age and rural surroundings. They seemed also in a fair way to keep more than even with the death-rate, while the continual loss by emigration is well offset by the love of this secluded sept of people for the tribal home. The city draws them, or the ends of the country draw them in early life; but with middle age the Indian hundred prevails and they are back in the trials and limitations of their environment. Of course the little community brightens by this outflow and inflow. In that sense there is a growth, but the best available estimate held their numbers to be nearly stationary. In area of occupancy they have perhaps contracted a little since the middle of the century, but I think not at all during the last twenty years.

They have quite lost their language. It is believed by them that Lydia Clark, great-great-grandmother of the gentleman above named, was the last of them who could speak it. To the day of her death she wore an Indian cap and short skirts, altogether refusing the ordinary garb of white women. Every relic of distinctly Nanticoke customs has disappeared as completely.

They have, of course, no tribal organization, but live on such land as they have been able to earn and buy, quite out of sight and reach of the Indian Bureau, with no sort of Governmental aid, and with more hindrance than help from anybody. They pay their taxes and vote like other citizens. For a long time there was a determined effort to crowd them into the ranks of the negroes, when the latter were denied many of the rights of citizenship; but their steady resistance and persistence have triumphed over it, although a certain measure of obstruction, disparagement, and jealousy may still be discovered about them. Their first church was burned down to compel them (as they believe) to worship with the negroes. They built a second, and the latter, they say, got possession of it. Then they built a third, and they assemble in it weekly to this day.

They are a neat people in their persons and homes. Myself

and a companion, with a rain-storm, took one of the latter by surprise, and we could not have been given anywhere a more dainty and tasteful room in which to sleep; it had nothing costly in it, but everything was bright and pretty and perfect. In the four-poster bedstead, the brass stair-rods of the carpeted stairway, no less than in certain slight, winning quaintnesses of speech, there lingered a reminiscence of older fashions and times. There were prayers before breakfast and grace at every meal, for these people are conscientious in religious observance, though in an unostentatious way. No one could have been more cordial in their welcome than this good old couple, and it was to strangers whom they had never seen before.

We visited one Indian mound, which they identified as having that character by continuous tradition, though they could not say who made it nor when. I paced over the crown of it from one point of its circumference to the opposite, and determined that interval to be approximately forty-eight yards. It seems to be settling in height and probably spreading. The elder Mr Clark said it had lost two feet in elevation within his memory; perhaps the sandiness of the soil may account for such subsidence. It is nearly as white as snow in parts of the field near by. Such a mound could have little more consistency than a sand-dune by the seashore, except where the roots of saplings and herbage have bound the shell of it together. There is a light growth of new timber over it, besides one large oak near the periphery, which, however, may be beyond the limit of the original mound. The present height seems not over fifteen feet, so that it is a very low and squat conoid. They told me of another tumulus, at a tributary of Indian river, known as Swan creek, where are also said to be the remains of a dam or some similar work.

The only distinctive thing that I observed in their architecture was a house with bright blue posts and corners, all the rest being white or nearly colorless. The effect was gay and primitive, not to say a little amusing.

I visited one Indian home where could be counted nineteen outbuildings of various size, including long rows of overflowing cornhouses, ample, well-stored barns, and all else that went to make up abundant evidence of thrift. The farmer who owned this place began with nothing; now he is able to give one of his sons a two-hundred-acre farm, keeps two sawmills in operation, maintains his fields and cattle in excellent order, and is popularly credited by the whites with being the *richest man in that region*. I heard his possessions estimated at \$60,000, which stands for more in southeastern Delaware between Cypress swamp and the ocean than a much larger amount in one of our great cities. The money had been made fairly by diligent labor, enterprise, and a vigilant eye to the main chance. "A man of good judgment and mother wit" are the terms in which he was defined to me by an Indian neighbor, relative, and friend.

These interesting people should not be neglected any longer. They ask no help, being very well able to take care of themselves, except that in the matter of school facilities the state of Delaware might go a little out of its way in their behalf. There would be no loss, but some fairness, in letting their taxes support their own schools. But the anthropologic world may brighten matters a little for them by showing that in their long struggle for individual existence they have at last become visible to the scientific eye. Certainly they have a nearly unique interest, sharing the position of the Pitcairn islanders as instances of successful modern hybridization of two widely different human-race stocks, the resultant type, when established, preserving itself wilfully from further intermixture or change.

I have called these people Indians, and certainly their dominant tone of feeling and the more obvious characteristics of some of their race warrant the name; but it is evident, also, that they have nearly as many white attributes of mind and body, habit and temper. The result is a singularly alert, versatile, capable kind of men, with no present sign of vanishing from among us.

SOCIAL ANTHROPOLOGY—A REVIEW

By ACHILLE LORIA

(TRANSLATED FROM THE ITALIAN BY ROBERT STEIN)

For some time there has been rising and assuming considerable proportions, a school of sociology that attempts to confront current doctrines (which in its opinion are baseless) with new and altogether different doctrines founded on the firm basis of biologic and anthropologic science. This new school, or new science if you will, has been called by its creators Anthro-po-sociology, or Social Anthropology, and it is already promulgated by numerous champions, among whom Lapouge in France and Ammon in Germany occupy positions of special prominence. In reality the objects set forth by these writers are far from being as original and unheard-of as they seem to believe, since it would not be difficult to demonstrate that they were in large measure anticipated by the theorists of the so-called Social Darwinism. Still, it cannot be denied that the teachings of the new school have been set forth by the writers mentioned in a sufficiently forcible form to impress the half-learned and even the learned, and to enlist believers in the new dogma. Now, in view of the inroads of this school and its growing influence, it seems timely here to subject its main doctrines to a brief examination; and this object will be attained by reviewing Otto Ammon's work, *Die Gesellschaftsordnung und ihre natürlichen Grundlagen* (The Social Order and its Natural Foundations), which has already been honored by a second edition, and has created a stir in the intellectual circles of Germany.

Sociology, says Ammon, must be based on anthropology, since man is the cell of the social organism, and one can have no knowledge of an organism except through a careful analysis of

the cells of which it is composed. Now, whoever applies to sociology the results of biologic and anthropologic science, as reorganized by Darwin, must necessarily consider the social aggregate as an eminently utilitarian institution, intended to secure the welfare and defense of the individual against untoward influences from without. Hence, of two species, one of which is socially organized and the other not, the former has a much greater chance of winning in the struggle for existence; hence, also, in the course of time only the socially organized species survive, while the others, by a fatal law, perish; in this way social organization becomes the universal law of beings. But while in the lower species the social organization is limited to a simple mechanical aggregation of undifferentiated individuals, and while in the somewhat higher species this is complicated by a certain differentiation of functions, in the highest species, man, society presents a most pronounced differentiation of functions and individuals, inasmuch as, through a wise division of occupations, society in the end assigns to each individual that special function to which he is best adapted—it puts the right man in the right place.

When one considers a great number of individuals from the point of view of intellectual capacity, he will presently discover that they are arranged according to the well-known binomial law—those of the highest intellect, the geniuses, are few in number; those between genius and medium intelligence are in greater number; those of medium intelligence comprise the largest number of individuals; those whose intelligence is less than medium are the fewer in number the lower their intellectual level; finally, the lowest grade, the cretins, are about equal in number to the geniuses. Now, human society cannot progress, cannot triumph in the conflict with rival societies and with nature, unless the function and social position of each of its members be adapted to his intellectual status; hence a sound social organization requires that the best positions be assigned to the best men and the inferior positions to inferior men; while of course it is highly

desirable that the number of the best shall increase to the utmost.

Luckily, human society, through a wonderful and unconscious tendency, has for centuries obeyed precisely this law of equilibrium and of progress. In fact, in human society it is the best, the worthiest, who win the highest positions, who reach the summit of wealth and power; the insignificant, the mediocrities, go to form the impecunious and laboring class, while the degenerate, the spiritless, and the silly furnish the contingent of the great army of prostitution, pauperism, and crime. Hence, to increase, so far as possible, the number of superior intellects, and to elevate their mental power, the segregation of the highest classes—their crystallization into privileged castes inaccessible to lower circles—is an admirable device, inasmuch as by it the individuals of those classes are rigorously obliged to unite in marriage only with individuals of their own class. In fact, a law that would guard against the marriage of individuals possessing superior qualities with those who lack them, would result in the avoidance of *panmixia* (as Weissmann would say), or that intercrossing of individuals gifted and not gifted with useful qualities, which leads to the fatal disappearance of those qualities in future generations and thus to the irreparable deterioration of the species. Therefore, it is highly desirable, in the interest of the human race, that the wealthier and more cultured classes should persist in their aristocratic exclusiveness to which they are already inclined, and should zealously practice Horace's precept, *Odi profanum vulgus et arceo* (I hate the profane crowd and keep them away). The evident proofs, continues Ammon, of the advantages of this method are seen the moment one observes the splendid results attained where the rule is most rigorously applied. As an example he mentions the princely marriages and the robust, intelligent offspring they usually produce.

At this point that invisible reader whom every writer has before him while he writes, will venture to express doubt concerning

the inevitable attribution of wealth and power to the most intelligent individuals, which, according to Ammon, is and always has been a fact through a sort of providential necessity. Is it quite certain, he will ask, that in the lottery of greatness and fortune the greatest prizes are drawn by the best? Is it true that rich and intelligent, poor and dull, are and always have been synonymous? But these childish doubts, the marks of profound ignorance of anthropologic laws, are received by the author with a smile of superiority. Above all, he says, if we compare the curve of incomes with the curve of geniuses, we find a marvelous correspondence between them—few great geniuses and cretins, and few greatest and least incomes; the greatest number of medium intellects, and the greatest number also of those of medium property; a gradual decrease in the number of those who stand between mediocrity and genius on the one side and cretinism on the other, just as there is a gradual decrease in the number of those whose wealth is between medium and the milliard on one side and the most abject pauperism on the other. Now, this parallelism demonstrates precisely that the individuals who occupy the points on the first curve are the same as those who occupy the corresponding points on the second curve; in other words, it furnishes the irresistible proof of the necessary correlation between the conditions of intelligence and of wealth. Furthermore, there is abundant proof, more direct and convincing, of such correlation. De Candolle showed long ago that the noble and high-placed families of the cities have produced a number of scientists far above the average. Again, "from the anthropologic studies I made in Baden from 1886 to 1894," continues the author, "it appears that among the higher classes the long heads predominate, while among the medium classes the broad heads predominate." Is anything further needed to give to every laborer on the globe a patent of imbecility and to every bourgeois a diploma of intellectuality? But that is not all. "Prof. Julius Wolf has found that the hats of laborers have lower numbers than those of

capitalists, and this fact was confirmed to me by a great German hat manufacturer." After this there is no longer room for doubt; superiority in wealth, it must be evident to every one, indicates superiority of intellect and is its most certain exponent; social inequalities are merely the reflex of natural inequalities; wealth is the earthly garland of genius. If there be some man of genius who is unable to amass a fortune, that very fact proves that his genius is unilateral, asymmetric, unbalanced, "as is the case," the author adds, "with several socialist writers."

Unfortunately, however, these higher classes, to whom is exclusively confided the material and social progress of humanity, are exposed to rapid extinction precisely on account of the excessive mental labor to which they are condemned by their lofty mission. Now, society, whose well-being depends so greatly on these classes, should endeavor, so far as possible, to prevent so deplorable a result, striving by every means to improve the lot of the choicest classes. Hence, far from lending its ear to the insolent pretensions of extremists and burdening accumulated wealth with new imposts, its load ought to be lightened: direct taxes ought to be reduced and finally abolished, and as nearly as possible the whole burden of taxation should be shifted, by means of indirect taxes, on the unintelligent, brutal herd. At the same time, let the issuance of public or state bonds be increased, since this will augment the numbers of those elect, exempt from the vulgar care of administration and management, who will divide their serene existence between the clipping of coupons and the sublime contemplation of the truth. Inasmuch, however, as these and similar devices will not suffice to guard against the extinction of the superior classes, it will furthermore be necessary that they be constantly reinforced, in the best way possible, from the lower orders. But whence comes that inflow of men called on to fill the gaps made in the upper classes of the city? The answer to this is given, in the author's opinion, by a well-known doctrine, which he attributes to Hanssen, though in

reality it is due to Dr Jacoby. According to this doctrine, which Ammon accepts without reserve, the rural population, being in excess of what is needed for agriculture, migrates to the cities and there presently rises to the top of fortune and possessions, supplanting the decadent city families, which are either extinguished or precipitated into the social abyss. So long as the agricultural class furnishes a strong, robust contingent, suitable to replace the ruined city classes, the process of social disintegration and reintegration goes on regularly and efficiently; but the moment the agricultural class becomes exhausted and no longer able to contribute men and force capable of reviving the city people, social decomposition is inevitable, and the state, society, and the race all drift miserably toward ruin.

All history, continues Ammon, shows that decay and ruin overtake nations always and exclusively when the superior classes become extinct while no equally vigorous and active stock is at hand to take their place. At some prehistoric time the autochthonous black-eyed race of Italy succumbed to the long-headed Aryans; Rome fell when the Aryan race of the patricians was overwhelmed by the inferior race of the plebeians. In Gaul, when the national aristocracy was destroyed by Cæsar, the mass of the population, composed of halfbreeds and roundheads, soon fell under the dominion of Rome. Subsequently the roundheads, which to Mr Ammon are veritable Medusa heads, multiplied, and thereupon the politics of France degenerated. In fine, when the revolution of 1789 raised to power the bourgeoisie, whose cephalic index corresponds to that of the mass of the population, the politics of France began to dissolve and the triumph of anarchy was at hand.

Sociology, and its related science, the philosophy of history, thus by itself points out, according to the author, the path which society must follow to effect reforms; so that this society, over which the author is so enthusiastic, after all requires, by his own admission, some wise reform. Nor does he hesitate to formulate

the program of the reform policy, such as clearly emanates from the anthropologic doctrines above set forth. It is in truth a somewhat complicated program; and the very multitude of remedies proposed might lead one to infer that modern society, after all, does not enjoy such robust health as the author affirms. From the rich bouquet of his social reforms we will cull only a few flowers, of the fragrance of which we will leave the reader to judge.

First of all, everyone might know beforehand that Ammon is an ardent opponent of universal suffrage, which represents the negation of the survival of the fittest, since it accords to the unintelligent masses an undue influence over public affairs. On the other hand, he is a friend of war, which he regards as a powerful instrument of selection, inasmuch as (shades of Mameli and Körner, pardon the blasphemy!) on the battlefield only the worse elements of society die, while the better ones come forth from it unharmed, and because the sons born after wars are more vigorous and strong than those who are born in days of peace. In the same way the author advocates all methods of eliminating the heterogeneous and inferior elements from the population; hence he does not disguise his sympathy for the persecution of the Hebrews in Russia, which once more proves the superiority of the despotic rule over the democratic rule which afflicts us.

Let it not be thought, however, that Ammon's Darwinism renders him averse to measures intended to benefit the poor classes. If the fate of society, according to his thesis, is exclusively committed to the rural population, it is absolutely necessary that the legislator shall take care that the agricultural population be prosperous and vigorous; in other words, a sound social evolution cannot be attained except by means of agrarian political philanthropy. Let the economic condition of the country people, therefore, be improved, and greatly so; not by means of their own initiative, but by the generous patronage of the great landowners and the cultured classes. Meantime, in

order to elevate the condition of the industrial laborers, let attention be given also to those laws of workingmen's insurance and to those various reforms "which are the imperishable glory of the never-to-be-forgotten Emperor William I and of his great Chancellor." It is true that these reforms are partial violations of Darwinian selection, inasmuch as they give rise to the survival of weaker and less gifted individuals; it is also true that the advantage which the laborers derive from said reforms is often rather problematic, since employers, in order not to incur the new charges, often close their shops and turn the laborers into the street. Yet nobody can advocate that the lower classes be decimated by misfortune and disease, since a just social sentiment rebels against such attempted extermination.

Hence, the author concludes, we should applaud social reform; but this reform must come from above as a gracious concession by the capitalists, men superior to the brutalized populace, not be extorted by the latter as the result of a reversed battle. Above all, let the working people, so long as found requisite, be tutored, benefited, even fed (not, however, too sumptuously, since over-abundance multiplies crimes against the person); but at the same time let them be kept in the inferior position befitting their intellectual inferiority. The working class should be inspired with sentiments of modesty and of reverence for the upper classes; it should be taught to abandon the baleful aspirations of invading democracy, which, admitting the lowest elements of the population to power, is directly at variance with the dogmas of social anthropology.

Such are the ideas which the author lays before the astonished sociologists of his time. They are not new, since in substance they amount to a sociologic application of those doctrines of Nietzsche which found their proper criticism, and a peremptory one, in the incurable paranoia with which their originator was afflicted. But several observations are peculiar to Ammon, or rather several rather grave errors, which must not be passed without notice.

First of all, his assertion that sociology must be based on anthropology, though at first sight plausible, is, like so many other *a priori* propositions, directly at variance with the truth. In fact, whoever looks at the development of social phenomena must notice that history is only in appearance the work of man, in reality it is the work of things; it is not made by the producers, but by the products, and arises by an inexorable necessity from the process of the distribution of products. Recognizing this we at once understand that the point of departure of the sociologist cannot be the study of man, but the study of wealth; in other words, the mother science of sociology is not anthropology but political economy.

In the next place, when the author observes that the very social and altruistic qualities of man are merely the product of the *instinct of defense*, since this instinct cannot be satisfied except through association, we are led to ask whether one can really speak of an instinct of defense congenital to man? Evidently defense presupposes offense; hence the need of defense cannot be felt by man except subsequently to an offense suffered; hence, also, the instinct of defense, far from being congenital to man, is a subsequent and derivative fact. The author would have been far more logical had he attributed to man a congenital instinct of offense; though in any case he would have found it difficult to explain the reason for this instinct, which does not bear any necessary relation to the undeniable and potent instinct of self-preservation. The fact is, it would seem, that the instinct of self-preservation does not of itself give rise to any instinct of defense or offense, and hence cannot, by means of such instinct, call forth association among men, which on the contrary springs spontaneously from the immanent necessity of production, from the struggle with the resistance of matter, owing to the impotence of isolated labor to overcome it.

The interpretation which the author gives to the biologic theories from which he draws his motives, often shows that he

has not succeeded in comprehending them. This is to be said in particular of his remarks on *panmixia*. According to Ammon, *panmixia* is an obstacle to selection, inasmuch as it leads to the gradual disappearance of the higher qualities in the course of generations. Weissmann, on the contrary, who coined the name of that process and set forth its action with great acuteness, tells us that it determines the disappearance of qualities and organs *which have ceased to be useful to the individual in the struggle for life*, and is therefore the inevitable condition to the production and development of other qualities or other organs rendered useful by the changed conditions of existence.¹ Thus, *panmixia*, far from being an obstacle to selection and to the evolution of the species, is the essential and integrating condition by which they are explained.

But let this pass, as well as the author's enthusiasm over the splendid offspring of princely marriages—an enthusiasm that is daily belied by well-known facts. There is one point, however, which we cannot dismiss unnoticed, namely, the vaunted physical and intellectual superiority of the wealthy classes, which the author tries to impose as a universal anthropologic law. Certainly we cannot successfully defend the inverse thesis, as was done by Helvetius and Adam Smith, and today is reaffirmed by Bücher, namely, that the rich are not rich because they are intelligent, but that they are intelligent because they are rich; in other words, that intellectual differences are solely the result of different social conditions. Surely this proposition contains more truth than the one which Ammon tries to support with rather feeble arguments. That noble and rich families, as he says, have produced a greater relative, not absolute, number of scientists and artists is not only possible but necessary, since only those families were able to give to their sons the education required to cultivate the liberal arts. Or can it be pretended, perhaps, that the sons of the poor, who at eight years, or even earlier, are

¹ Weissmann: *Aufsätze über Vererbung*, Jena, 1892, pp. 559 ff.

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thrust into the infernal whirlpool of the mines and factories, can become Byrons or Raphaels? And then, what are we to say of Ammon's startling demonstration of the parallelism between the curve of incomes and the curve of genius? First, let us note that, in order to make the curves coincide, the author is obliged not only to manipulate his data rather laboriously, but also to suppose that individuals deprived of income or afflicted with a negative income are fewer in number than the possessors of the least income. Now, this supposition is ruthlessly belied by statistics, which demonstrate, on the contrary, that the phalanx of the unemployed and the rejects are at present assuming proportions exceeding those of the most wretched fraction of the working class. Given this fact, it is at once evident that one can no longer speak of a curve of incomes, and hence, that the incomes are distributed according to a law altogether different from the law of distribution of genius. But leaving this aside, let us assume that there are really two curves, and that they agree perfectly. In order that this fact may constitute a real proof of the pretended correlation between wealth and genius, the author must prove that the persons occupying the different points on the curve of incomes *are the same* as those who occupy the corresponding points on the curve of genius; in other words, that the successive classes of income-getters are composed of the same individuals who comprise the successive classes of intellects. Now such a demonstration, it is hardly necessary to add, the author does not and cannot give; without it his two curves tell us absolutely nothing, and authorize no conclusions whatever in regard to the question under discussion. Thus Ammon's thesis has no other foundation than the greater width of the hats used by the rich—a frail argument, to say the least, since everyone knows what value can be attributed to the craniometry practiced by hatters.

As regards Jacoby's theory, with which Ammon connects the entire philosophy of history, it must be admitted that it thor-

oughly recognizes the relations of emigration and immigration existing between the two fundamental economic classes, the poor and the rich, and justly attributes to these relations an eminent sociologic importance; yet it is not difficult to see that it gives a far from exact interpretation to the phenomena which it tries to elucidate. In reality, the surplus of the agricultural class that migrates to the city does not go to swell the rich class, but, at least immediately, the poorest and most abject class; they form the social residue of the great metropolis, the dregs of the fluctuating population—dock laborers, stone-breakers, beggars, drunkards, prostitutes. If some members of the destitute class succeed in rising to the ranks of the bourgeoisie, these fortunate ones are not exclusively recruited from among the immigrants from the country, but in large part from the city-born laboring population itself; and conversely, if it be true that some members of the well-to-do class lapse into poverty, they do not belong exclusively to the city population, but may be part of the country population. The fact is that the distinction, rather academic than positive, between city and country, unnecessarily encumbers and obscures the phenomenon of the changeable relations between the poor and the rich classes, a phenomenon which, considered in its real essence, amounts to this: that some members of the poor class, taking advantage of good wages, succeed in penetrating into the rich class, while some members of the latter, ruined by the processes of redistribution of wealth and by the degeneration which wealth at its height produces, drop down into the class beneath; whence arises a *chasses-croisées* among some members of one class and of the other, or a fractional mutation of the individuals of which the two classes are composed.

On the other hand, the theory of Jacoby may indeed explain the decomposition of one race, the degeneration of one people; but it cannot throw light on the much more important phenomenon of the dissolution of the social forms. Let us grant, in fact, that the ruin of imperial Rome, as Jacoby asserts and Ammon

repeats, was due to the extinction of the upper Latin classes and to the exhaustion of the rural class that ought to have replaced them; and that this decay of the Italian population rendered it an easy prey to the strong race from beyond the mountains. But how came it about that, simultaneously with the dissolution of Roman society, the relations of production, which it had developed, were dissolved? How came it about that on the ruins of these there arose a system of economic relations totally different not only from the Roman system but also from that previously existing among the German conquerors? That these phenomena cannot be attributed to the action of the anthropologic factor is shown by the not infrequent examples in history, of entire nations subjugated and destroyed, while no innovation in the relations of property arose from such disaster. More than this, history presents numerous examples of social revolutions accomplished without any accompanying ethnical extinction or revolution, the greatest example being the grand revolution that placed the bourgeois class in power, a revolution accomplished everywhere without being accompanied by any extinction or mutation of race.

Now, all this proves clearly that the cause of social revolution lies not in a change of man or in the anthropologic factor, but in a change of things, or in the economic factor. It is the internal transformation of the relations of wealth production, or, to ascend to its first cause, of the relations between the population and the earth, that constitutes the fundamental factor from which flow, by a natural necessity, the great historical changes in society—in its organic constitution. If Ammon does not understand this, if he is pleased to treat economic phenomena with disdain, if he considers them as a secondary, nay, as a disturbing (!), element of social evolution, it can be explained only by the author's incredible ignorance of political economy, which he appears to have derived solely from the superficial, biased, and partisan publications of Professor Julius Wolf. Sombart pointed out not long ago, and

with good reason, that no economist would venture to write on biology with such ignorance of biologic laws as Ammon showed of economic laws when venturing to theorize on sociology. I will add that the ignorance is aggravated in this case by the shallowness and partisanship of the only book from which the author has gathered his meager and disconnected notions of social economy.

If from this hasty sketch a synthetic conclusion can be derived, it may thus be summarized: The book we have examined may be regarded as a caricature and a *reductio ad absurdum* of the biologic method in sociology, and of the attempts made to find in it the justification of the present capitalistic ownership. Hitherto, in demonstrating the essential fallacy of the so-called Darwinian theory of property, economic arguments had to be invoked, which show that property arises, develops, and disappears through causes altogether independent of the sagacity or incapacity of the owners, through the immanent and fatal process of the relations of production and population. But Ammon's book, with its errors, its paradoxes, and the absurdity of the practical conclusions to which it leads, constitutes a direct proof, drawn from anthropologic and biologic studies themselves, of the fallacy of a scientific tendency which pretends to turn social science into an appendage of anthropology. Desiring to see this attempt abandoned as speedily as possible, we earnestly recommend to all sociologists an attentive and patient examination of the volume which we have criticized in these pages.

THE HARMONIC STRUCTURE OF INDIAN MUSIC

By JOHN COMFORT FILLMORE

NOTE—The following paper was prepared for the American Association for the Advancement of Science which met last year in Boston, but it was not presented owing to the sudden death of Professor Fillmore a few days before the meeting. Through the generous kindness of his widow and son, I am now able to offer it for publication, and to supply from his manuscript records the illustrations he had intended to present with it.

Professor Fillmore entered on the study of Indian music at my request in 1888. For several years previously I had been gathering and examining aboriginal songs, and had discerned in them musical problems that required for their solution not only technical skill, but a broad and comprehensive culture. I sought long and widely to find one with the requisite attainments and the requisite courage to enter this unknown field and to grapple with its unknown problems. At last I was directed by some musical scholars to Professor Fillmore, and the result has proven his fitness for the delicate and difficult task he essayed.

His interest in music as a science added zest to his original research. He writes: "These Indian songs have an important bearing on such questions as the origin of scales, the relation of primitive melody to harmony, the naturalness of our major and minor scales, the progressive development of them, and the fundamental question, What is the line of least resistance for the human voice in primitive man making music spontaneously?" All these questions he lived to solve.

Professor Fillmore's use of the term "primitive man" is not to be taken in its technical sense. He says: "We are now forever unable to get at the real primitive man and to observe his processes in the evolution of folk-song. But surely the songs which show us the actual process of transforming excited howling into songs with unmistakably harmonic pitch-relations, take us very far back toward primitive music-making. What we should find if we could get still farther back I do not know; but I cannot resist the conviction that it would not be inconsistent with the evolutionary process already discovered."

The tracing in Indian songs of motivization, of finding them "as

strictly developed out of modified repetitions of a motive as are the movements of a modern symphony," proved for him "a most delightful and fascinating occupation."

His remarkable work, cut short by his untimely death, bears abundant evidence of his thoroughness as a student; of his power to discern fundamental truths in the most meager material; of his rare gift of tonality which enabled him to exploit folk-songs with an ability never exceeded; of his soundness of judgment and his fairness of statement. He has made possible a study of the evolution of music along lines that correlate with those which have lifted the desultory observations on man into the science of Anthropology.

ALICE C. FLETCHER.

Probably everyone, at the first hearing of Indian music, is impressed with the difference between it and our own. That is my own experience, and is also the experience of all other white people I have known who have come in contact with Indian singing. The impression made is that of a crude, barbaric attempt at music which seems to have very little in common with our own. We do not at once discover what this music means to the Indian; we do not see that the savage strains express, to those who make them, any of those emotions we are accustomed to associate with music. In the case of some of the wilder and more savage tribes, the sounds we hear bear so much greater resemblance to the yelps and howls of wild beasts that we may be impressed with the feeling that these people, when they are singing at least, have more in common with the lower animals than with us.

In the case of many who make no attempt to go below the surface, this impression persists. I have met not only uneducated frontiersmen, but even cultivated people, who seemed unable to get rid of the impression that Indians have no music worthy of the name; that is, no music which is intelligible to us as expressing emotions which are common to the race. I have even known this opinion to be publicly expressed by men distinguished in one or another department of science, and even in music.

There are also many who seem to get the impression that Indian music differs essentially and fundamentally from our own,

not merely in power of expression but also in its melodic structure. Many who have heard more or less of Indian music, either directly or in phonographic reproductions, seem to think that Indian melodies are the product of natural laws different from those which determine the structure of our own melodies. They frequently fail to recognize, in the intervals out of which Indian melodies are made, those which characterize our own; or if they do think they recognize familiar intervals, they also think they discover differences which may be essential, and they fear to class them under our own familiar chord and scale intervals, lest they should, as one scientific investigator once put it to me, "import our Aryan ideas into the music of alien races." In short, there is an impression abroad that Indian music is based on one or more scales different from our own and characterized especially by smaller intervals than any which find place in our civilized music.

In this paper I shall confine myself to an examination of the essential structure of Indian melodies and a careful comparison of them with our own folk-melodies with reference to the intervals of which they are made.

My title to speak on this subject rests on a ten years' study of Indian songs, a study which has been at least honest and careful and as thorough as I have been able to make it. The incitement to it came originally from Miss Alice C. Fletcher, who induced me to study her very large collection of Omaha and other songs. In doing this I had the invaluable assistance of Mr Francis La Flesche, who not only gave me days and weeks of his own time, but accompanied me to the Omaha reservation and obtained for me opportunities not otherwise attainable. This study was afterward supplemented by improving the unusual opportunities afforded by the World's Columbian Exposition, where Dr Franz Boas afforded me the opportunity to study a large number of Kwa-kiutl and other songs of the northwest, and where I also recorded songs of the Navaho, besides making some valuable collections

on the Midway Plaisance. I am indebted to Dr Washington Matthews for the opportunity of studying his collection of phonographic records of Navaho songs, and am of course acquainted with the published songs studied by Theodor Baker, Stephen Powers, and Benjamin Ives Gilman. Dr Carl Lumholtz gave me a number of songs which he collected in Mexico among the Tarahumare and Tepehuane, tribes seldom visited by white men; and Mr Charles F. Lummis, of Los Angeles, introduced me to several Tigua Indians of the pueblo of Isleta, New Mexico, from whose singing I recorded some twenty or thirty songs. Other songs have come to me from different quarters during the three years I have spent in California, and last summer I visited the Coahuila reservation in that state and obtained some very valuable material. Quite recently I have obtained from Dr Lumholtz several new songs from Mexican tribes not hitherto reached. I have also listened to several hundred songs recorded on the graphophone by Mr La Flesche, including rituals from at least a dozen tribes and half a dozen linguistic stocks, some of which had never before been exploited. Many of these records are of special value because they come from old pagan priests who have never been in the least affected by missionary work or by contact with the whites, but who were the repositories of the most ancient traditions of their race, of which these songs are an essential part. It should also be mentioned that I have a limited acquaintance with Eskimo songs; and it goes without saying that careful comparison has been made with old-world folk-songs, especially the numerous Magyar and Slavic, and such Arabic, Turkish, Malay, Chinese, Japanese, and other songs as I could obtain. Altogether I have studied many hundreds of aboriginal American songs, of many different tribes and linguistic stocks, ranging from the Arctic ocean to Central America and from the Atlantic to the Pacific, enough, I am confident, to warrant general conclusions as to the laws which determine the forms of our aboriginal melodies.

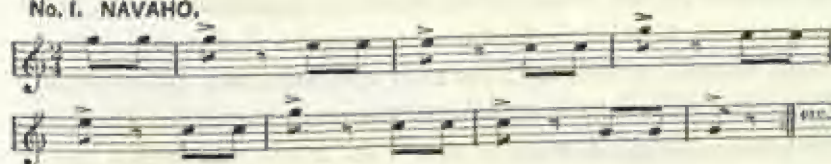
I say laws, for I assume that the forms taken on by primitive

melodies are no more accidental than are any other natural products, mental or otherwise. Vocal music, of course, precedes all instrumental music by an immeasurable interval. When vocal music is made spontaneously, without reference to any theory, it must follow the lines of least resistance, must obey the general law of all activity, physical and mental. The real questions to be determined, then, in studying the structure of primitive songs, are such as these: What direction does the voice take when primitive man expresses his feelings in song? Is that direction the same for all races of men, or are there different laws which govern the kind of intervals used by different races?

I ask your attention, therefore, to a number of characteristic examples of aboriginal songs, taken from tribes belonging to different linguistic stocks and dwelling in widely separated portions of our country, and which for the greater part have not as yet been published.

I present first some songs of the Navaho tribe as being the most primitive in character of any I have yet studied. They form, in fact, the connecting link between excited howling and excited singing. The quality of tone is indescribable, being more like a yelp than anything else; but the intervals yelped are unmistakably those of the major chord or of the minor chord.

No. 1. NAVAHO.



The *tone-quality* is that of shouting, or even howling, but the *pitch-relations* into which they tend to fall are those of the major chord. There is a key-note or tonic which persistently asserts itself and predominates overwhelmingly throughout the song. Associated with this key-note are only two other tones:

the major third and the fifth of this key-note, making a major tonic chord.

No. 2. NAVAHO.



This song also is made exclusively of the tones which compose the major chord, only here the key-note predominates so strongly as to make the song exceedingly monotonous. The line of these melodies is a chord line, a harmonic line.

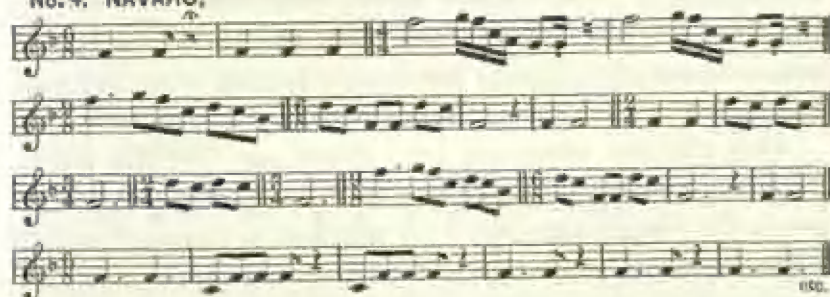
No. 3. NAVAHO.



Some of the Navaho songs are illustrations of melody so primitive as to bring us very near to the beginning of music making. In example 3, C is plainly the key-note, and the song is confined mainly to that tone and its minor third, E flat. G, the remaining component of the tonic chord, does not appear at all, but B flat comes in at first so decidedly as to suggest E flat major as the tonic chord. It also appears later as a bye-tone. The implied harmony of the song is plainly the chord of C minor as tonic, and its relative major, E flat.

In all these primitive Navaho songs the gaps between the chord tones are filled up by tones belonging to the nearest related chords, viz., the dominant, the subdominant, and the relative minor. These intervals, when arranged in consecutive order, produce exactly the major or minor scales which we ourselves use, although seldom complete.

No. 4. NAVAHO.



This song is plainly in a major key, the key-note being extremely prominent and the chord tones predominating. The second and sixth tones of the major scale come in as bye-tones, the former being so used at the ends of some of the phrases as to imply the dominant chord. The song is in the well known five-tone scale.

I will now present a song which has more developed diatonic melody than any of the preceding examples :

No. 5. NAVAHO.



The song is in a major key, and tones of the major chord predominate ; but it employs somewhat prominently the sixth tone of the major scale and much less prominently the second and seventh tones. Its characteristic melodic phrase—

No. 6. NAVAHO.



which is repeated many times, is as completely diatonic as our own melodies. The sixth of the scale, as here used, plainly im-

plies a harmony closely related to the tonic, either the subdominant or the relative minor chord. The seventh of the scale is here used as a mere melodic bye-tone leading up to the key-note. The second of the scale occurs only once in the whole song.

How old these songs may be, I cannot say; but they are undoubtedly very old. They belong to the ancient pagan ceremonies of the Navaho tribe, and I see no reason to suppose that they are in any way affected by the contact of this people with civilization. What these Indians sing in the way of intervals is undoubtedly natural for them. Now, it is a very striking and suggestive fact that of all the Navaho songs I have studied, about one-third have no tones whatever except the key-note and its third and fifth. Of these about two-thirds are major and one-third minor. Nearly half the songs have either the major or the minor chord with a single bye-tone; about one-sixth have the major or minor chord with two bye-tones, and the remainder have more than two bye-tones. *Not one has an interval different from those we employ.* The line of least resistance, for the Navaho at least, is clearly the line of the major or minor chord in the simplest songs. In the more complex ones, one or more tones belonging to the nearest related chord are added, until in the most elaborate songs our full scale appears.

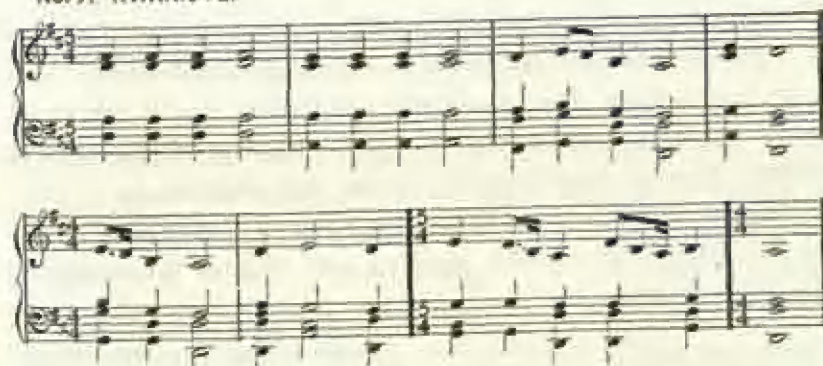
Let us now consider some of the songs obtained from the Kwakiutl tribe of British Columbia, of which I have studied more than a hundred. The results obtained are similar to those reached from the study of the Navaho songs. Although their ethnological character is entirely different, from the structural point of view they are the same. They are all harmonic or diatonic in character.¹

¹ In order to facilitate the better understanding of Professor Fillmore's analysis of these songs, I give the two Kwakiutl examples harmonized. These songs were transcribed by Professor Fillmore from the Kwakiutl Indians themselves, at Chicago, in August, 1893, during the World's Columbian Exposition. After they had been transcribed they were played to the Indians on a piano, and were pronounced correct. Then, under the Indians' criticism, and with their approval, the harmonization here given was

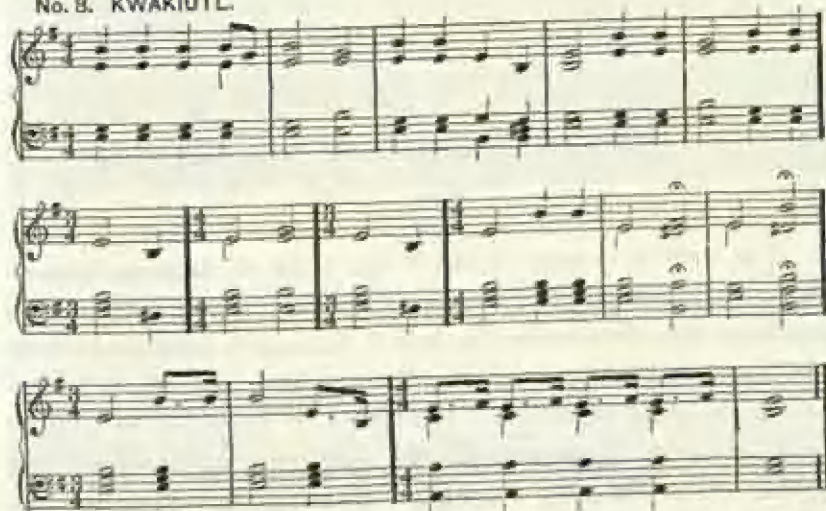
The following example is in the five-tone scale, the major diatonic scale with the fourth and seventh omitted.

added to the aria. The present form, therefore, not only gives the melody as sung by the Indians, but reveals the harmonic structure of the song itself:

No. 7. KWAKIUTL.



No. 8. KWAKIUTL.



Concerning the last example Professor Fillmore writes: "The cadence is best made with the subdominant before the tonic, i. e., a plagal cadence. Although this chord is not *necessarily* implied in the melody, it makes the close more natural, and is most satisfactory alike to civilized and uncivilized ears. All this is directly in the line of my previous investigations in Omaha music, and tends to confirm the conclusions towards which these investigations seemed clearly to point. The most important of these conclusions is, that the forms assumed by primitive songs are determined (unconsciously to those who make them) by a latent sense of harmony; that, conse-

No. 7. KWAKIUTL.



The song is plainly in the key of D major, and every phase of it implies harmony as clearly as does any civilized music. It is built on the tonic, dominant, and subdominant chords; its tonality is strongly marked, and it ends with the plagal cadence which I have so often found in Omaha and other music.

The next song is clearly in the scale of E minor, with the fourth, sixth, and seventh omitted, and implies the tonic and dominant chords.

No. 8. KWAKIUTL.



The next is a song of the Yaqui tribe of Sonora, Mexico. Señor Arturo Bandini, of Pasadena, California, who owns a large ranch on the Mexican border and is intimately acquainted with the Yaqui Indians, assures me that this song belongs to a very ancient religious ceremony. It consists of the tones of a minor chord with one bye-tone near the end, implying the dominant chord. It is the only example I have yet found among our American aborigines of any attempt at part-singing. When it is repeated, the women sing the fifth of the tonic chord to a single syllable at the interval of a twelfth above.

quently, the question of the *scale* on which any given song is built is a wholly subordinate matter, and really resolves itself into the question of *what is the natural harmony* implied or embodied in the song."—A. C. F.

No. 9, YAGUI.

1st time.  Men alone.
2nd time.  Women.
Men.

Study of the songs of the Zuni and Tigua Indians of New Mexico yields the same results. In the following example, a Tigua song of the wheel dance, the tones imply and even actually embody chords. The song is made up mostly of the chord-tones C-E-G, with C predominating. The only other tone in the song is A, the sixth of the scale.—

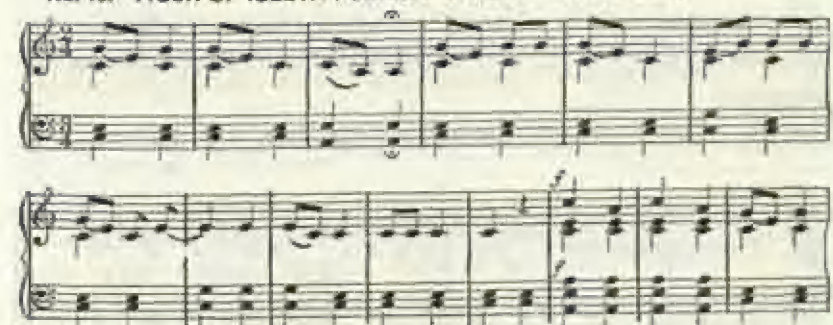
No. 10. TIGUA OF ISLETA PUEBLO. (Song of the Wheel Dance.)



The two chords embodied in the song are the major tonic and its relative minor.¹

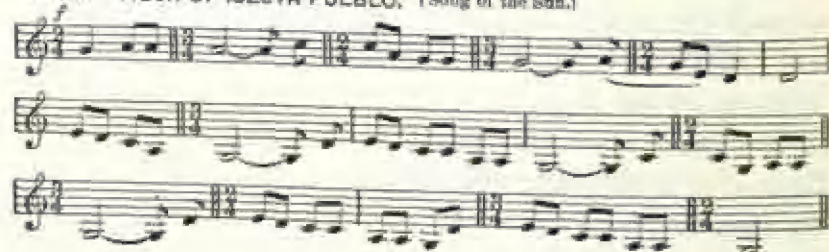
¹ For the sake of clearness I give the same song as harmonized under the criticism and with the approval of the Indian from whom Professor Fillmore transcribed the song.—A. C. F.

No. 10. TIGUA OF ISLETA PUEBLO. (Song of the Wheel Dance.)



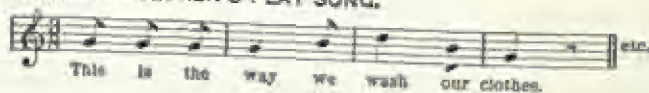
The next song is from the same tribe and pueblo. It contains the same tones as the preceding one with the additional tone D, the second of the scale, implying the dominant chord. These tones, C, D, E, G, A, make the familiar five-tone scale :

No. 11. TIGUA OF ISLETA PUEBLO. (Song of the Son.)



The songs of the Tarahumare and Tepehuane in Mexico, those of the Sioux, Winnebago, Omaha, Ponka, Pawnee, and of the various tribes of California, as well as the Eskimo, all show characteristics similar to those already presented. In short, I have yet to find a single song of any of our aboriginal peoples which is not as plainly diatonic and harmonic as our own. If we compare them with any of our real folk-songs, such as—

No. 12. CHILDREN'S PLAY SONG.



the old hymn-tune, "When I can read my title clear," and other examples drawn from bagpipe music, we cannot but see that the differences are merely of an ethnological character; that is, they are differences of style and manner, not differences in essential structure.

The essential thing in all music is the relation of tones to a tonic



or *key-note*; and the tones most nearly related acoustically to any given key-note *are the tones of its triad*. Then come the tones belonging to its relative minor triad and to the dominant and subdominant triads. Somewhat less nearly related are the tones belonging to the major triads of the under and over major thirds and sixths.

The following Omaha song employs the under major third:

No. 13. OMAHA.



In this example there is a change of key within very narrow limits. The first two phrases, comprising only three measures, would seem to be clearly in the key of G, while the remaining two phrases, of two measures each, seem to be in the key of C. The A flat in the song cannot be treated as a mere chromatic by-tone; it is an important melodic note—it is principal, not accessory. A flat is the chord of the (major) under-third of C, in which key the song closes, although it begins in the key of G. The tones in this song can easily be accounted for on harmonic grounds, but not by a reference to any known form of scale.

The question of tonality in all these songs is a question to be settled by the help of harmonic considerations and not otherwise. The case becomes stronger when we come to take into account the melodies which more or less plainly imply modulation. The following Omaha choral is such an example:

No. 14. OMAHA CHORAL.

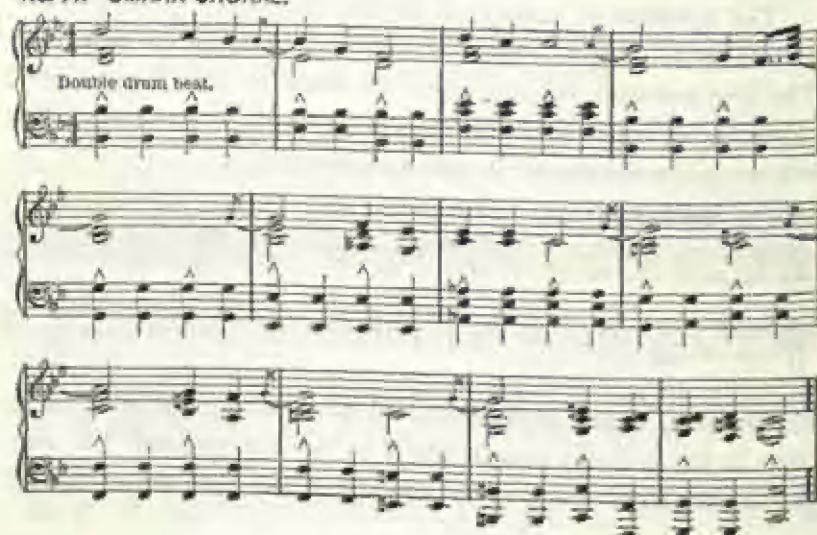


The song begins in the key of B flat, and there is not a single tone in the melody, except the E in the last measure but one, that is not to be found in the scale of B flat; yet the course of

the melody is such as to force on one the sense of a change of key. A study of this song shows its harmonic structure. The original key is kept until the fifth measure, in which the first clause ends with the relative minor chord. The next phrase of three measures is in the key of E flat (the subdominant), the third measure effecting a transition to the key of F by means of the chord of G (the over-third of E flat), followed naturally by the chord of C (the dominant in F). The last clause begins in F, modulates to C in second measure, and closes the period in that key. This key, the major over-second of B flat, the original keynote, would seem to be so remote as to make it impossible to preserve unity within the limits of a short twelve-measure period. But the melodic flow is so smooth and the harmonic connections so natural that one does not get from it the impression of anything forced, harsh, or unpleasant, nor feel the need of a return to the original tonic. The whole choral impresses one with its beauty, nobility, and dignity.¹

¹ This analysis will more readily be followed by referring to the harmonized version here given. In regard to this version it is important to state that it was made under the criticism and accepted as satisfactory by the men who were the leading singers of the tribe:

NO. 14. OMAHA CHORAL.



I now offer for comparison a few specimens obtained from the Midway Plaisance at Chicago in the summer of 1893.

The following is a cannibal song which I noted down in the South Sea Island Theater on the evening of September 2d. The rhythm is strongly marked; the song proceeds on a single tone until the very end, when it changes to a tone which is a component of the dominant chord, assuming, as we naturally do, that the predominant tone is a tonic. I give it what seems to be its natural harmony.¹ It illustrates steadiness of pitch on a mono-

I have many times heard this choral song by three hundred or more Omaha men and women during the ceremony to which it belongs. This unison-singing in octaves brought out the harmonics so strongly as to make it difficult at times to realize that I was not listening to part-singing.

It may be well to repeat here that it was due to my discovery, some fifteen years ago, that when an aria was played on a piano the Indian preferred it with a harmonic accompaniment, that Professor Fillmore was induced to search for the reason of this strange preference. He wrote concerning this search and his conclusions:

"The songs submitted to me for scientific study, and also for harmonization to be tested on the Indians, caused this suggestion to ripen in my mind, as well as in Miss Fletcher's, into the conviction that the fact of the Indian's preference for a harmonized version of his song when given on a piano, points to a natural and universal law, namely, that all folk-music runs on chord-lines. Study of these Omaha songs, including the harmonizations of them which were submitted to Indian criticism, tended steadily toward the confirmation of this belief, and subsequent study and experience, extending over several years and including a varied observation of the folk-music of different races, have, as I believe, furnished ample grounds for trustworthy induction.

"The laws under which folk-music is everywhere produced may thus be formulated:

"1. Primitive men are impelled to sing, as they are impelled to shout and to dance, by emotional excitement.

"2. All expressions of emotional excitement, whether they be bodily motions or vocal sounds of whatever sort, tend to take on rhythmic forms. Rhythm is the first esthetic element to be developed.

"3. Rhythmical shouting comes after a while to acquire a certain degree of musical quality by becoming recognizably definite in pitch.

"4. This increasing definiteness of pitch manifests itself in three ways: (1) By steadiness of pitch on a monotone; (2) by going, more or less plainly, from one tone to another of a major or minor chord; (3) by moving along the line of a tonic chord with the addition of tones belonging to chords nearly related to the tonic.

"... The primitive man, when he makes music under the impulse of emotional excitement, moves along the line of least resistance; and if several hundred songs collected from nearly all the races of the earth are sufficient to warrant an induction, *that line is always a harmonic line.*"—A. C. F.

¹ I shall give the accompanying illustrations with Professor Fillmore's harmonizations, as he intended to give them on a piano when reading this paper.—A. C. F.

tone, and its one movement is to a tone belonging to the nearest related chord:

No. 15. SOUTH SEA ISLANDS. Cannibal Song.



I obtained at the same place the Fiji war dance which follows. It implies a major and its relative minor chord, only here the center of gravity seems to be on the minor and not on the major chord:

No. 16. FIJI WAR DANCE.



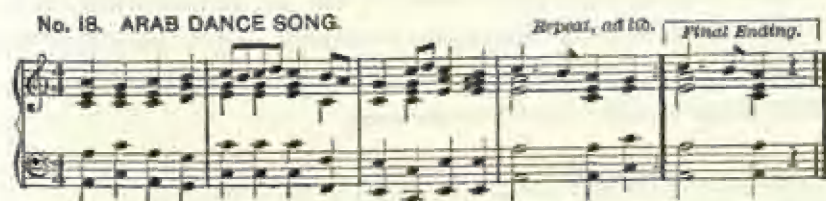
The following war song I recorded in the Dahomey village. Before each of the war dances which I there witnessed, a warrior stood forth and sang a short solo, apparently addressed to the head-chief, who was seated near the orchestra. These solos invariably consisted of repetitions of a single phrase, sometimes modified and sometimes not. One of them was made up of this phrase:

No. 17. DAHOMEY WAR SONG.



It contains the tonic chord and also A, the tone which, with C and E, would make the relative minor chord of the tonic. It offers another illustration that when the tones move off the line of the tonic chord they move on to the line of a chord nearly related to the tonic.

The following Arab dance song, which I heard many times, was first sung by several girls alone, and then accompanied by an oboe while a girl was dancing. It is in a plain minor key, implying the tonic chord, its relative minor and the major dominant:



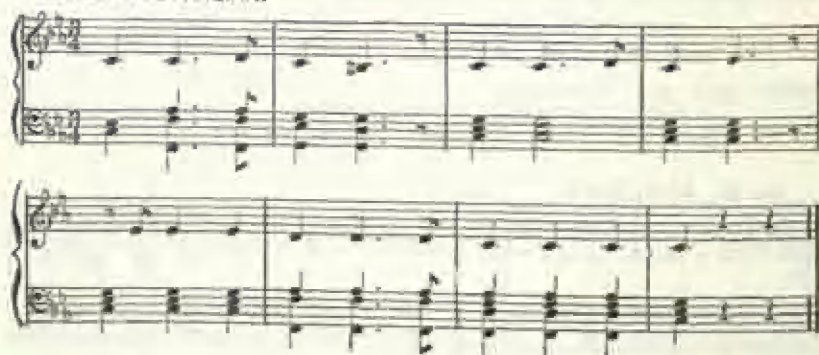
The next is also an Arab song. It is in minor and implies the tonic and the dominant seventh. The bye-tones, which are rather numerous, all belong to the latter chord:



These two examples are particularly interesting, because it is commonly said by musical theorists and historians that Arab music is very different from ours, in that the octave is divided into seventeen tones and such minute intervals are used that the occidental ear cannot appreciate them, except very imperfectly. But Dr Land, a Dutch student of Arabic music, has shown that this is an error. The Arab lute, he says, does indeed provide separate strings for the sharps and flats; but one set is used for the sharp keys and another for the flat keys; the two are never used for the same tonality. By this means each key is in pure tune, instead of being tempered as in our system, so as to make, for example, C sharp and B flat identical. The *tonality* of their music, whether major or minor, corresponds precisely with our own. This tallies exactly with my own observations of the Arab folk-music at the World's Fair.

I obtained the Australian song from Dr Carl Lumholtz, who learned it from the people themselves while he was living with them. Curiously enough, it is much more elaborate than either the Dahomey or South Sea Island songs. The harmony naturally implied in it, is the tonic, dominant, and the subdominant sixth, commonly known as the supertonic chord with a seventh. No modern composer could have produced a song with a more definite minor tonality than has this song :

No. 20. AUSTRALIAN.



I could multiply examples from the Hindoo, Russian, and Chinese, but I give but one more, a Japanese lullaby, which I obtained from M. Takaki, on July 23, 1894. It is in the same old five-tone scale :

No. 21. JAPANESE LULLABY.



In the case of races which have progressed beyond folk-song and have a theory of music and musical instruments, we are of course no longer dealing with primitive music; but it is important to note that even among these peoples their folk-songs are made on the same five-tone scale that we have found among sav-

ages and which is familiar to us in the old Scotch and Irish music.

The process of development seems to be this:

1. The key-note and its chord.
2. The addition of one of the two bye-tones which are the sixth and second of our major scale, probably the sixth before the second.
3. Both these bye-tones come in with the chord to make the five-tone scale.
4. The tonality is major or minor according as the *do* or the *la* is made the point of repose, this probably being determined by the character of the feeling expressed in the music.
5. The fourth and seventh of the major scale are afterward added to complete the dominant and subdominant chords.

In all this process it would seem that *a natural perception of the harmonic relations of tones is the shaping, determining factor.*

It seems clear, also, that this natural perception is the same for all races of men, depending on the physical constitution of the ear and of the vocal chords, and their correlations with the laws of acoustics on the one hand and with the psychical laws of the relation of music to emotion on the other.

But I shall be asked, and with entire pertinency, "Are you *sure* that the intervals sung by the Indians whose songs you have studied are the *ones* you have transcribed?" I answer without hesitation, Yes, I am sure. I started my investigation with the impression that there might be essential differences in structure between the Indian music and our own. I studied the Indian music for ten years with the utmost care and thoroughness of which I was capable. I have failed to find one single interval in Indian music which we do not use. It is true, I have often heard Indians sing these intervals out of tune; but this is a phenomenon by no means confined to savage or uncivilized races. In every such case, when I was singing with Indians and was able to get at their real intention, I have found that they meant to

sing exactly the interval we should sing in their place. The false intonation was due usually to precisely the same causes which produce it in our own singers. Sometimes it is an untrained or defective ear; there is just as much difference between Indian as between white singers in this respect. Sometimes it seemed to be due to an imperfect correlation of the ear and the vocal apparatus, just as it is with us. Sometimes it comes from pitching a song too high or too low. In short, an Indian singer, for the greater part, does just what a white singer of his grade of musical culture would do under the same conditions.

But I have observed also special causes for aberrations from the pitch intended by aboriginal singers. Chief among these is *emphasis*. I have frequently known Indian singers to emphasize a tone by striking it ahead of the beat and from a quarter of a tone to a tone above pitch. When I noted these tones down as bye-tones, I was met by the criticism that I had written *two tones when only one was intended*. When I played it emphatically as a simple syncopation, the Indian declared it to be correct.

I have also found Indians vary from pitch under stress of emotion, especially in love-songs. I have noted down intervals as I heard them, only to be told that they were wrong. The Indian *meant* to sing a plain diatonic interval, for he declared this to be correct when I played it. Although he had actually sung it from a quarter to a half tone below pitch, he would not tolerate my playing of anything else than the plain diatonic interval. All of this goes to show, among other things, that the Indian does not make nice discriminations in the matter of pitch. It shows also, what is very clear from all my experience, that what the Indian is thinking about is purely the expression of his feeling, and not the nicety of his intervals,—that has to take care of itself. But it makes the evidence as to the forms spontaneously assumed by his songs all the more forcible.

I have also found that increase of power is almost always accompanied with increased elevation of pitch, and diminution of

intensity with a lowering of pitch, seemingly without the Indian being aware of it. When I have asked Indians to sing louder into a graphophone, they have invariably raised the pitch. Songs which remain of the same intensity throughout I can easily play with them on a piano. Songs which vary greatly in intensity, such as love-songs, do not go well with piano accompaniment, because they vary not only the power but the pitch with every variation of intensity. Yet they will not tolerate these variations when they hear them from an instrument. Clearly they *intend* plain harmonic or diatonic intervals, and are not aware that they vary from them.

The same is true as regards the matter of sliding from one tone to another instead of making the outlines of pitch definite. The practice of Indians in this respect can be matched in any camp-meeting of negroes or uneducated whites in the United States. There is really nothing unusual about it. And as for the Indians appreciating smaller intervals than we do, there is simply nothing of the kind. The Indian ear is not more but less discriminating than our own in the matter of musical intervals; this is to be expected, since he has had no training whatsoever. When he intones an interval a quarter tone off pitch, it is not because he intends to do so, but because he is groping more or less blindly after an interval imperfectly conceived. The instant he hears it correctly given, he perceives that it is what he was trying for and immediately conforms his intonation to ours. That has been my experience over and over and over.

Further, it has been my experience many times repeated that the Indian prefers the harmonized to the unharmonized version of his songs when they are played on the piano—that is, of course, when the chords used are the ones naturally implied or embodied in the melodies. All the Coahuia songs, all the Tigua songs, all the Omaha songs, and many of the others, have been played over and over again for Indians, as many as could be reached at different times, both with and without harmony, and

always with the same result. With the natural harmonies the songs when played on the piano sound much more natural to the Indian than when played without chords.

In the light of all this experience I feel justified in stating once more, and most emphatically, the conclusion at which I have arrived, namely, that when savage man makes music spontaneously he obeys the universal law of all activity and follows the line of least resistance, and that in every instance this line is found to be a chord line, a harmonic line. Folk-melody, so far as now appears, is always and everywhere harmonic melody, however dim the perception of harmonic relations, and however untrained and inexperienced as regards music the untaught savage may be.

The first harmonies to be displayed are naturally the simplest—those of the tonic and its chord. The more complex relations are gradually evolved as a result of the growth of experience. But in every stage of its development, the harmonic sense is the shaping and determining factor in the production of folk-melody.

The evidence of the essential unity of all music, from the most primitive to the most advanced, is cumulative. The Navaho howls his song to the war gods directly along the line of the major chord; Beethoven makes the first theme of his great "Eroica" symphony out of precisely the same material. The Tigua makes his "Dance of the Wheel" out of a major chord and its relative minor; Wagner makes Lohengrin sing "Mein lieber schwan" to a melody composed of exactly the same ingredients. In short, there is only one kind of music in the world. But there are vast differences between the stages of development represented by the savage and by the modern musician; and there are also ethnological differences resulting from the physical and mental peculiarities of the races; yet, essentially and fundamentally, music is precisely the same phenomenon for the savage as it is for the most advanced representative of modern culture.

TECHNOLOGY, OR THE SCIENCE OF INDUSTRIES

By J. W. POWELL.

INTRODUCTION

An industry is an activity whose immediate motive is the production of welfare for self and others. The term welfare has various meanings, but here we use it as signifying welfare of life—not esthetic, moral, expressional, or mental welfare. An industry by this definition means an activity exercised to promote life. We must remember that in this discussion, which is meant to be scientific, whether it succeeds or not, the term *industry* is used in this sense and in no other.

We use *activities* as a generic term including five species: esthetics, industries, institutions, expressions, and instructions. In this paper we are to consider industries.

Technology is the science of industries. An industry is an activity whose purpose is welfare or livelihood. We must here make clear the distinction between esthetic activity and industrial activity. The maid dances for the pleasure of herself or of others. If she dances for others it is a pleasure for them, though she may dance for gain, that is, welfare; still, it is an esthetic activity. A company of musicians make music for an audience; the audience pays for the entertainment. To the musicians the making of the music is an industrial activity, but to the audience it is an esthetic entertainment. Thus, whether an activity be designed for pleasure or for welfare will often depend on the point of view of the person interested therein.

The housewife prepares the meal for her own welfare and for the welfare of others. She may flavor the food to make it more palatable; the purpose of the condiment is thus pleasure; but the preparation of the food is still an industry, the secondary

motive a pleasure. A feast is given for pleasure, but the food still sustains life; so pleasure and welfare are concomitant. In high civilization many activities are pursued for the pleasure of the people by persons who have welfare as their purpose.

Again, what is conducive to welfare may be productive of pleasure. The housewife in preparing the meal for welfare may have, and usually does have, these double motives. If we neglect the motive of welfare and act only from the consideration of pleasure, pleasure itself may be curtailed or pain may be produced. If the housewife, in catering to pleasure, uses condiments that are unwholesome, pain may be produced, and whether her act in compounding the cake be good or evil in effect will depend on whether she has considered both welfare and pleasure; only then do her acts become wise.

Motives are many and usually compound, and it requires no small degree of abstraction to discover the elements of motive even in self, while in others, whose minds are expressed in their acts, the task is still more difficult; for though the motive is best read in symbols of deeds, still, whether it be good or evil is often difficult to say. But every activity is performed for a purpose, and all demotic activities are performed for demotic purposes. We are now classifying activities as demotic activities; but in classifying them in this manner we must ever remember that altruism is founded on egoism and that a demotic activity has an individual effect on the doer. A man may play the violin for others in order to gain money with which to make a journey of pleasure; thus his motive may be immediate pleasure for others and remote pleasure for himself.

This is a concrete world, and abstractions do not exist in themselves, but only in human consideration as abstracts. Every abstract has its concomitants from which it cannot be dis severed, except in consideration. We may classify motives as motives for pleasure, welfare, peace, expression, and wisdom; and by abstraction we may consider any one of these motives, although they

cannot exist apart. Every activity, when performed, involves all of the concomitant effects. The world is concrete, but the method of consideration is often abstract.

Industries are classified as substantiation, construction, mechanics, commerce, and medicine.

SUBSTANTIATION

Certain activities of welfare are fundamental thereto, because they are necessary to life. We must breathe air, we must drink water, we must eat food, we must seek shelter from the elements, and we must wear clothing. In the pursuit of these necessities of life, human activities are employed even in the primordial stage of savagery. Four of these necessary activities are pursued by the lower animals—they seek water, food, and shelter for their young and sometimes for their companions—but artificial clothing is not worn by them. Activities pursued for the welfare of self and others are industries.

The natural kinds fundamentally necessary to man are found by experience to be air, water, rocks, plants, and animals.

Air is necessary at every minute of life, and it is so abundant that man is not required to produce artificial air, though as civilization advances he finds it necessary to provide for its purity.

Water also is abundant. Man does not find it necessary to produce water from its elements, but he does find it necessary to produce it at the place where it is needed and to provide for its purity.

Minerals are found to be useful to man primarily, perhaps, for shelter; soon they are found useful as tools, and he engages in their production by quarrying and mining.

Plants are found to be useful to man as food in all its varieties, as sap, leaves, bark, roots, seeds, and fruits. Plants are also useful to man in providing shelter, and various parts of the plant are used in the construction of houses by human devices. Plants are also found useful to man in fibers as clothing.

Finally, animals are useful to man for food, shelter, clothing, and other purposes.

Thus, tribal man utilizes all of these kinds or natural substances, for which he especially develops the industries of quarrying (the simpler stage of mining) and agriculture for the production of natural plant products and natural animal products. Tribal man uses natural substances developed by natural chemistry; civilized man not only uses the natural substances, but he produces innumerable artificial substances by artificial chemistry.

The production of kinds or substances, whether natural or artificial, leads to the distinction which we are trying to make of the class of industries which we call fundamental industries. They are those in which men engage for the purpose of producing substances, whether they be natural or artificial. Fundamental industries may well be called substantial industries because they produce substances.

All industries are productive industries, and the product is consumed. Production is thus the correlative of consumption, and correlation must be distinguished from reciprocity and from antithesis. Reciprocity is the double consideration of a thing as a whole or as the parts of which it is composed; antithesis is the distinction between good and evil; correlation is the consideration of relation between terms, neither one of which can be expunged if the relation exists. This is the distinction we must make between producing kinds and producing forms. A man may produce apples by cultivation, when he produces a kind; when he produces cider from the apple he produces another kind or substance. A man may produce a flint by quarrying it, or he may produce it even by picking it up; he then produces a kind of rock; but when he makes the flint into a knife, he produces a form.

In tracing a series of transmutations from material to product, we may always reach a stage where the material is finally consumed or used. To use an unfamiliar but very useful term, bor-

rowed from metaphysic, we may say that an entelechy is ultimately reached. The entelechy is the final end had in view by the exercise of an activity.

In tracing material through its transmutations from its original state to its final purpose, there arise a succession of correlations, the terms of which are known as production and consumption. How these terms are used will be made clear by a few illustrations: Primitive man produces flint from the quarry and consumes it in making the arrowheads which he produces. With his arrowheads he produces rabbits; thus his arrowheads are said to be consumed when they are lost or destroyed, but there is still the production of rabbits from the wold, and this production is consumed as food.

The farmer purchases a tract of land covered with forest. The forest land he converts into a field; the forest he consumes perhaps for fuel, and the fuel is the product which he consumes for welfare, and the entelechy is reached. The field remains from which he grows corn, and the year's production of the field is consumed; but the corn remains as a product, which is material for the miller, which he consumes as miller's material by grinding it, thus producing meal; the meal is baked by the housewife who consumes it as meal in producing bread, and the bread is eaten by the farmer's household and consumed, thus producing welfare, which is the entelechy.

The lumberman cuts logs in the forest; he consumes forest trees and produces logs; the raftsmen consumes them at the place where they were produced, and delivers them at the mill as the product of his labor; the product is the log delivered at the mill. The log is material for the miller, out of which he produces lumber; logs are consumed and lumber produced. To the builder the product of the miller is material which the builder consumes in the product of his labor, which is a house; the domiciliary user consumes the house in welfare, and this welfare is the entelechy. Maybe the lumber is used for making furniture, then lumber is

consumed and furniture is produced, and the furniture is consumed in the production of welfare, which is the *entelechy*.

The planter purchases a field on which he raises cotton; the time of the field, that is, its power of producing for a year, or, in other terms, the interest of the purchase money for the field for a year, is consumed in the production of a crop. The labor on the field is also consumed, and the field of cotton is produced. Then the cotton from the plant is picked, and the field of cotton is consumed by the picking of the cotton bolls; the cotton now becomes the material for another process. Overlooking minor operations, it becomes material for the spinner, who makes a product of yarn; the cotton and the labor employed are consumed by the man who makes a product of cloth. Then the tailor consumes it as cloth, together with an amount of labor necessary to make it into clothing; then the clothing is consumed by the wearer, when it reaches its *entelechy*. Thus land, by a series of human processes through intelligent labor, produces welfare through a series of changes in which labor is consumed.

In the course of production from one kind to another and from one form to another, the domain of nature and art is ransacked for the purpose—air, water, land, plants, and animals are utilized and a multitude of persons are employed.

In the consideration of production we must contemplate the natural material found in air, in sea, in land, in plants, and in animals. The air is ambient over all the surface of the earth as a hollow sphere of gas. The sea has its gulfs, bays, and straits, with its auxiliaries in springs, lakes, and rivers, while the lower portion of the air is laden with moisture which is partially gathered into clouds and precipitated on the earth in rain when favorable conditions prevail. Thus the water is a sphere of liquid which intervenes between air and land. The sea with its auxiliaries yields its materials and the air yields its materials. Plants are scattered over all the surface of the land not covered with liquid water, and over a part of the surface of the land which is covered with

liquid water, and over a part of the surface of the water, while animals inhabit the atmosphere and the watery envelope or hydrosphere. What is usually called the land is but the upper surface of a third sphere of solid rock which is denominated by geologists as the lithosphere; this lithosphere contains another and important portion of the substances which are produced for the welfare of mankind. The lithosphere, the hydrosphere, and the atmosphere, together with the plants and animals of the earth, constitute the environment of mankind. All human industries are therefore included in the consideration of the sources of the substances which men produce.

Hence, when we classify the substances of the environment in these five groups, we classify them in coördinate groups from the consideration of the environment of man, though we may afterward subclassify every one of these groups. We are not classifying substances as fundamental classes, but we are classifying the substances used by man as fundamental classes, and the subclassification will still include only the substances used by man.

Man is a denizen of the air; he lives on that portion of the surface of the lithosphere which is called dry land, where the watery envelope is vapor. Thus he is directly connected in his environment with the three spheres and utilizes them for his purposes. Man is not content with the natural products of the lithosphere, but he seeks to improve them. He is not content with the natural products of the hydrosphere, but he seeks to improve the water by purifying it or by charging it with other substances. He is not content to drink like the beast from the pool or the stream, but he seeks to bring the water to himself in the most convenient and best manner in which to enjoy it. Man is not even content with breathing the atmosphere, but he seeks to procure it in its purity, so he ventilates his habitation and otherwise secures the greatest purity. Man is not content with the plants as they are furnished by nature, so he improves them by cultivation and multiplies those which are useful to him and destroys

those which are useless or injurious. Man is not content with the animals, so he improves them by zoöculture and he destroys the useless and the injurious.

To designate those industries in which men engage for the purpose of producing kinds or substances, we need a technical term which will distinguish them from all other industries; for this purpose I use the word *substantiation*, which must here mean the artificial production of substances for human welfare. I have sought long and far for the best term. I may not have chosen wisely, but I have chosen with all the wisdom of which I am possessed. It does not lie in the prerogative of another to reject my term when he attempts to understand my meaning, though it may be his prerogative to use another term when he desires to express the same meaning. If the distinction pointed out is a valid one, and useful for scientific purposes, a distinctive term is necessary; if the distinction is invalid or unfruitful to science, it may be neglected. Do not quarrel with me about my terms, but quarrel with me about my distinctions. If you decide that the distinctions are good, then accept my terms as they are used, still reserving the right to use better terms when you wish to set forth the same concepts.

In the transmutation of materials into products, the processes must be invented; but the product which is sought in manufacture may be but a small part of the material used. Metals are extracted from the ores, while the residuum is often valueless. Quinine is extracted from the bark of cinchona trees, and the product is very small compared with the trees. Sometimes secondary products are found still of value to mankind. From asphalt and other hydrocarbons illuminating products are manufactured, and from the substances which do not subserve this purpose aniline dyes are extracted. So by invention a multitude of substances are derived which serve human purposes. Forever by art, substances are multiplied and their manufacture specialized.

(1) In modern culture man produces pure air by purifying it;

(2) he produces pure water by purifying it; (3) he produces various substances by mining and metallurgy and other chemic processes; (4) he produces plants by plant culture, and (5) he produces animals by zoöculture. Thus, the fundamental industries, which we here call industries of substantiation, are industries for the production of kinds.

CONSTRUCTION

The next class of industries in which men engage are those which are designed to modify the forms of things for use. Here we must call attention to the distinction which we make between *kind* and *form*. In popular usage these terms are interchangeable, but in science we must use terms with single meanings; this is a fundamental requirement. The failure to observe this law opens the door to idle and vain speculation. We may find an illustration of what is meant by kind in ordinary enumeration and in the devices which men have invented to represent numbers. We have ten units as a sum; the ten units constitute but one ten, twenty units constituting two tens, and a hundred units constituting ten tens. The ninety-ninth is but one of the units of a hundred; it is but one in the last unit of the second order which constitutes the hundred. Counting is fundamentally determination of kind; and counting, like classification, is first determining a kind and then seriating the kind to obtain the class. I wish to count the horses in the field, and I must first distinguish the horses from all other kinds in the field and then enumerate them. This is counting. But if I distinguish the kind of horse and include them all as horses, I thus include all of this kind in nature. The difference between counting and classifying exists solely in the nature of the series which we consider. I invariably use *kind* in this sense and in no other.

Form signifies figure and structure, and implies the relative position of the parts which make up the whole. This distinction which I make between kind and form must be held permanently.

You must not fall into the habit of confusing the terms as is done in common speech. In science we must use form to mean one thing and kind to mean another, and unless we adhere to this it is impossible to make scientific advance. Every man loves to use words as his neighbors use them, for speech is but a convention, and unless the convention is understood by others it is an unknown tongue; but no man has a right to demand of another that he use his words with the same meanings as himself if the other defines his meanings, and still less has he the right to demand that another should use a word with many meanings and thus obscure his language.

Man produces the clay when he digs up the kind of clay, or he may produce the kind of clay by mixing ingredients; but when he molds the clay into a brick he determines the form. He may mold the clay into a vessel, then he also determines the form in which it is useful.

Man produces forms of things that he may utilize air, water, rocks, plants, and animals. He utilizes air when he produces things that insure proper ventilation. A chimney is a form for this purpose; an opening in a room and a shaft in a building are forms of this character; a fan is a form designed to secure a better movement of the air.

For the utilization of water primitive man constructs a gourd into a drinking cup, or he molds clay for the purpose of holding water, or he constructs wicker-work jugs for this purpose; so man digs wells and constructs reservoirs, and lays pipes for the transportation of water, and in higher civilization he constructs filters for the purification of water. Thus, innumerable forms are constructed by man for the utilization of water.

In the same manner many forms are produced for the utilization of rock material. The rocks are built into houses as rock structures proper; the clays are molded into bricks or adobes to be built into houses. Iron is extracted from the rock and molded into innumerable forms for men's use. Copper, gold,

and silver are in like manner produced as substances and wrought into forms which serve men's purposes for welfare.

Plants are used for fuel and wrought into forms that they may be utilized in stoves and furnaces. Plants are also wrought into forms of lumber and used in constructing forms of houses, furniture, vehicles, and ten thousand other shapes, that they may be useful to man; and many substances are extracted from plants to be wrought into forms. Many resins are used in this manner; indeed the productions of forms from the product of the rubber tree that are useful to man are too great for enumeration.

Time fails me to tell of the innumerable forms into which animal substances are wrought for the use of man. But animal substances and vegetal substances have their grand use as food. The forms into which they are converted before they reach the entelic use are innumerable, but the subject is so often illustrated in daily life that to call attention to the fact is all that is necessary to our purpose.

In the production of entelic forms many ancillary forms are produced. These, perhaps, are so apparent that they need no further illustration; but the forms which are produced by man through industrial processes that serve the entelic purpose of welfare are innumerable, and when we distinguish them it becomes necessary for us to group these industries under one term in order that they may properly be distinguished from the industries of substantiation and from others which we have yet to consider. I shall therefore call them the industries of *construction*, as that term seems best to convey the concept. In late years there has grown up in science the use of a term which clearly sets forth the nature of the products of construction as the term is here used. This is artifact; the products of construction are artifacts. Construction, therefore, is the industry of producing artifacts, just as substantiation is the industry of producing substances. As substantiation is the art of producing substances from air, water, rock, plant, and animal, so construc-

tion is the art of producing useful forms of artifacts from air, water, rock, plant, and animal.

Form and kind are concomitant. There can be no kind without form, and there can be no form without kind, and the distinction which we here make is but a distinction in consideration which classifies the industry. The world is concrete; but man's method of looking upon it is often abstract, and so his knowledge is ultimately built up into concepts of concrete things, which are first considered as abstract things when concepts of abstract things are utilized. All properties and qualities are abstract, but they inhere in concrete things. Concrete bodies and their abstracts as properties and qualities require abstract concepts for their cognition. Again must we recall the demonstrations of the pentalogic essentials of every particle of matter incorporated into the bodies of the universe. That there are five and only five of these essentials is the ultimate purpose of this discussion, and the ultimate demonstration must remain in view if we are to understand the nature of the argument.

MECHANICS

In classifying industries as those of substantiation or those of construction, we were compelled to use terms with specific meanings, and we selected the terms used because they seemed to be the most available for that purpose and because there seemed to be no terms in use for the industries which we wished to discriminate. Manufacture etymologically means "made by hand." In all industries the hands are used to a greater or less extent, and the term is used with this wider significance, so that its etymology and wider use alike forbid its employment to signify what we desire when we adopt the term construction. In the case of *mechanics* we have a term which is already used in science for the purpose we wish, signifying the industries which have for their purpose the utilization of powers.

The mechanical devices as forms which are employed in the

utilization of powers are the hammer, the lever, the wedge, the wheel, and the pulley.

A hammer is a device for condensing the motion of a ponderable body through a space in a time and expending it in an instant; or it may be defined as the method of expending gathered momentum in the instant of impact.

A lever is an instrument which is used with a fulcrum to move a weight by taking advantage of the motion in an arc of a larger circle to the correlative arc of a smaller circle, so that the force of the long arm is expended in the short arm. A smaller mass is thus made to move a larger mass, but the smaller must move a greater distance. A hammer which is used for percussion is often supplied with a handle, which is a lever with a fulcrum in the edge of the hand. Thus the long arm of the lever is next to the hammer, and the momentum of the hammer is increased thereby.

A wedge is an inclined plane used to subdivide the distance of the weight moved into minute parts. The wedge itself is usually employed in conjunction with the hammer, the wedge being a device for subdividing the distance moved, and the hammer being used to take advantage of the force of percussion.

A wheel is a device for reducing friction, and the friction is reduced inversely as the perimeter of the wheel is enlarged over the perimeter of the axle. The wheel is variously modified for the reduction of friction.

A pulley is a succession of wheels so geared that the force applied must move over a greater space than the weight to which it is applied; hence a larger mass may be moved by a smaller, as in the case of the lever.

These forces—the hammer, the lever, the wedge, the wheel, and the pulley—are often combined in the same mechanism. Thus, in the screw, the lever and the wedge are combined, but the wedge is a spiral wedge. These fundamental mechanical devices are combined in a great variety of ways in the machinery of the industries.

These devices for applying power are sometimes called the mechanical powers, and the powers themselves are called forces, for they are devices to produce modes of motion.

Again I must remind the reader that there is no such thing as abstract power; it is always concrete, and its concomitants must always be considered when we consider real power as such. Power exists as an abstraction only in consideration.

Having considered the nature of powers, we have now to consider them as they are utilized in tools and machines. A tool may be defined as an implement employed to utilize human power. A machine may be defined as an implement employed for using any other power than that of human muscle. The tool is dependent on the hand and is adapted to the use of the hand, while the machine is adapted to the use of other powers than that of the hand, though these powers may be directly or indirectly controlled by the hand. A flint may be fashioned into a knife on a grindstone supported by a wooden horse; the grindstone is a tool, but it may be run by water-power, when it becomes a machine, for it must be provided with the apparatus necessary to utilize the fall of water. A hand-hammer is a tool; but a trip-hammer is a machine, for some other power than that of human muscle is used in its operation. The hand-dasher in a churn is a tool; a power dasher in our modern dairies is usually a machine. The flail is a tool used only by human power; the thresher is a machine in which horse-power or steam-power is employed.

In the multiplication of processes, which we have already illustrated somewhat, many machines are employed in the manufacture of a single class of products. Often these machines are housed for their protection and for the protection of the laborers who are operating them. Such a group of machines with their houses is called a mill or a factory. In the mill many machines may be used, and many tools, all designed for the common purpose of producing a class of objects.

It now remains for us to set forth the classes of powers which are used by men to promote their welfare. These are muscular power, wind-power, water-power, heat-power, and electric power.

Muscular power—This power is the primordial force used by mankind, first as human power, but in the second stage of human culture animals were domesticated and used as beasts of burden. Especially is one animal used for this purpose, namely, the horse, and the power of a horse for a definite period of time, established conventionally, has come to be used as the standard of measurement for powers. Animals are used not only for carrying and hauling burdens, but they are used also for impelling machinery.

Wind-power—Wind-power is used to propel machinery and especially in the navigation of water to propel vessels, and the machinery devised for the latter purpose consists of masts and sails. In the early history of civilization the propulsion of vessels and the running of mills were relatively much more common than at present, and yet this power is widely used. Since air has been liquefied it seems likely that this substance is to play a still more important role in mechanics, and air is to become a commodity.

Water-power—Water-power is used chiefly for the running of mills. The tides as they rise and fall are utilized in their onward rush to impel mills by the construction of the necessary machinery, and the fall of water in running streams is utilized for the same purpose. Water is used also as steam to connect heat-power with machinery.

Heat-power—This power is obtained from the combustion of plants and animals and the hydrocarbon products derived from them. Steam is but a medium through which heat-power is applied.

Electric power—Electric power is also a medium for transmitting wind-power, water-power, and heat-power; but it also seems to be an independent power itself. Not being a physicist I am not competent to properly discuss this subject.

This whole discussion of mechanics may be considered as exceedingly elementary and to be but a simple exposition of common knowledge. It serves the purpose of this discussion all the better for this fact, for we are trying to exhibit the nature of the activities in which men engage for the purpose of classifying them and discovering how five properties of matter and only five are recognized in these activities, and for the further purpose of showing how they lead to five classes of emotions.

COMMERCE

The fourth great class of industries in which men engage for the purpose of obtaining welfare is *commerce*. Men do not produce substances everyone for himself, but everyone for others. They do not produce constructions everyone for himself, but everyone for others. They do not produce powers everyone for himself, but they produce powers everyone for others. The production of substances, artifacts, and powers are designed for the consumption of others; they thus become the materials for exchange, which are then goods.

Goods are produced, as we have already seen, by substantiation, construction, and mechanics, and there are other agencies which we have not yet considered. These products pass from one person to another in exchange before they are consumed as an entelechy. Every exchange implies a production and a consumption until the entelic consumption is reached.

The five properties of matter give rise to five elements of commerce, which we must now set forth. The first element of commerce consists of the goods or kinds of things which are exchanged. The second element is transportation, which means the transfer of commodities from one person or place to another. The third element is the labor involved in making the exchanges. The fourth element involved is the money employed as the medium of exchange and measure of value. The fifth element employed is advertising, which is the method of informing those who desire

goods for consumption that others have them and offer them in exchange for money. The five elements of commerce, therefore, are goods, transportation, merchandizing, money, and advertising. Every one of these elements of commerce involves activities—the activities of producing goods, the activities of transportation, the activities of exchange, the activities of finance, and the activities of advertising. They follow in this order from the nature of qualities which are derived from properties. Nature has established the order in which properties must be considered, for Nature herself considers them in this order. Now we have to consider the five elements of commerce severally for the purpose of considering the elements of which they are composed.

Goods—Goods are classified as esthetic, industrial, social, linguistic, and instructional.

Esthetic goods are ambrosial, decorative, athletic, gaming, and fine-art goods. These may all be reclassified in five groups. We have already seen¹ how the fine-arts may be classified, giving rise to goods which are musical, graphic, dramatic, romantic, and poetical. In the same manner industrial, social, linguistic, and instructional goods may be classified and reclassified. Every value which man produces becomes goods, for in its production he expends activity, which is labor, and receives in return for his labor the goods which he desires. In modern society the goods are obtained through an intermediate commodity—money—which is the measure of value and instrument of exchange.

Transportation—As men produce not for themselves but for others, and receive money in exchange which they expend for themselves, the things which they produce must be transported to the others. A man may produce an article which his next-door neighbor uses, and the transportation from one to the other is but an inconsiderable item. But the production may be a hundred or a thousand miles away; then the transportation be-

¹ *Esthetology, or the Science of Activities Designed to Give Pleasure* (AMERICAN ANTHROPOLOGIST, n. s., vol. 1, p. 16).

comes an important element in commerce; hence ships and railroads are constructed, and large bodies of men are employed in these industries. At first thought these industries along the great highways seem to absorb our whole attention, but on more minute consideration we find that the transportation of commodities for short distances is no inconsiderable item. Thus, the transportation of the bread, milk, and other items of trade through the streets of the city and the highways of the country, from the marts of trade to the individuals who are the entelic consumers, is of much relative importance. The transportation of commodities altogether will be found almost to vie in importance with the production of commodities by substantiation or construction or mechanism. We find that all of these operations are concomitant.

To the carrier, goods transported become freight. Goods and freight, therefore, are the same thing from different standpoints of consideration. In transportation we have to consider not only the freight but the substances, the constructions, and the powers employed in freighting, as well as the persons who direct the operations.

We must notice the correlation involved in transportation. In every transaction which involves transportation there is a producer and a consumer, and each party is both. The man who produces wheat is the consumer of the goods for which he exchanges wheat, so that there is correlative transportation. But the subject of correlation is to some extent masked through the employment of money as a medium of exchange, for as goods are not exchanged directly, the correlation of transportation is in the first step the transporting of money in one direction and the transporting of goods in the other. When credits are used as symbols of money, the correlation is still further masked, and wherever a man may be he has demands which must be supplied. These demands must be transported to him, because he lives on the goods produced by other men which must be transported to

him. The ultimate correlation is dependent on the equity of transactions.

There is still another phase of transportation that must be mentioned without stopping to fully set forth its nature. A man's wants may be supplied by transporting supplies to himself, or they may be supplied by transporting himself to them. No inconsiderable part of transportation is employed in transferring individuals themselves.

The substances that are employed in transportation are air, water, rocks, plants, and animals. The constructions that are employed in transportation are (1) those which are designed to utilize the air, such as ships that are impelled by sails and pneumatic tubes which are utilized by air pressure; (2) those constructions which are employed to utilize water for transportation, such as the steam-engine and that machinery by which material is transported from one part of the mill to another by water-power; (3) those which are employed to utilize wood, or coal (which is fossilized wood), for transportation; (4) those appliances which are necessary to utilize animal muscles for transportation, such as saddles, common road vehicles, and all of those articles which have become necessary when human beings transport freight; (5) all of the tools and machinery which are employed in the utilization of electricity for transportation.

Exchange or Merchandizing—The man whose industry is buying and selling goods is the exchanger, and he regards goods or freight as commodities. Goods or freight thus become commodities to him, but the merchant has to buy his commodities instead of to manufacture them. The industry of merchandizing is therefore distinct from the industry of transportation, as the merchant is also distinct from that of the mechanician who produces useful powers, or from the constructor who produces useful forms, or from the industry of the man who produces useful substances. The elements of merchandizing are buying, storing, exchanging, delivering, and gaining. In buying, the merchant must consider

the wants of the people ; in storing, he must consider preservation of the goods ; in exchanging, he must consider the value of the goods ; in delivering, he must consider the distribution of the goods to his customers ; and in considering gains he must consider the total cost to himself and compare it with the amount received, which may show profit or loss.

Money.—This leads us to the fourth element of commerce, *i. e.*, money, which, as one of the commodities, has to be considered as a value in relation to the other commodities, which are goods. Money consists of gold, silver, subsidiary coins, bank-notes, and credits. In different stages of culture different articles have been used as money, such as shells, wampum, peltries, tobacco, and cattle ; but in modern civilization the five kinds of money are almost universal.

It has already been considered important that the value of money should be permanent, so far as this can be secured by human agencies. If we consider long periods of time, this has never been accomplished. The device which the more advanced nations have adopted is to make either gold or silver or both, at a fixed ratio, the measure of value, and then by statute to provide that subsidiary coins should be issued by the government. It is provided further that bank-notes should be made exchangeable with coin at the option of the holder who presents them for payment ; but in modern times credits are very largely used in transactions, so that much of the money used in commerce is of this nature.

The business of the banker is the handling of money for a profit. He must therefore be a capitalist—must have money of his own,—and the amount of money or credit of others which he handles, other things being equal, will depend on the amount of capital which he has invested either directly in banking or as security which it affords to the public in his transactions. In modern business much is transacted by credits, which are a kind of money, and the capital of the banker is held by his customers

as either moral or legal security to them. The business man deposits money with the banker and draws it out on check from time to time as he uses it. A banker, having the deposits of many men, finds that he has in his custody a surplus of money which is more or less constant. This surplus he lends at interest; he also lends his own money; his profits, therefore, come from the lending of money—either his own or the money deposited. The banker lends money to the public, but he is especially a lender of money to his depositors; thus, a merchant may deposit money by giving his note bearing interest, against which he draws by check.

Advertising—This leads us to the fifth element of commerce, which is advertising. In advertising, that which was first considered as goods, then as freight, then as commodity, then as value, is now considered as want. The merchant's business is to supply want, and it becomes necessary for him to inform the public of the goods which he offers for their supply. The method of giving this information to the people is advertising. The primal method of advertising is by the display of the goods themselves by the merchant or his assistants; no small proportion of the time of the salesmen is occupied in displaying goods to purchasers. The second method of advertising is by the display of goods in conspicuous places, especially in show-windows; this method of advertising has now become well-nigh universal; show-cases and window-cases are arranged with deft hands in order to make goods attractive. The third method of advertising is with post-bills, which are placed in conspicuous positions—on the walls of buildings, on fences, and by the wayside, or worn on the backs of men. The fourth method of advertising is by the distribution, through carriers or by the mails, of hand-bills, which are designed to inform the public of the character and prices of the goods offered for sale. The fifth method of advertising is the insertion of such business announcements in books and periodicals. Much of the advertising is now absorbed by the peri-

odicals; the daily, weekly, monthly, and quarterly journals are to a large extent supported by advertisers who display in type the goods offered for sale, but the journals themselves are introduced to the public by the publication of news and the discussion of current topics, all of which are desired by the people.

MEDICINE

We have now to consider an industry which is designed to secure welfare for mankind in preventing, alleviating, and curing the diseases or other injuries to which men are subject. This industry is founded on the importance of securing the best opinions of men especially trained in the learning which pertains to sanitation and the remedies which are discovered to alleviate and cure diseases; it is especially an industry of opinions. Formerly this feature of the industry was somewhat masked by the more or less constant habit of medical men to furnish the medicines and appliances which they use, and to charge for the same rather than for their opinions. But an industry has been differentiated from medicine proper and is relegated to the apothecary who supplies, as merchandise, the medicines and appliances, and the merchant obtains them from manufacturers who produce constructions and substances.

Here we have to note a peculiar habit of language by which the industry of medicine is called a profession. It will be observed that those persons who engage in the highest form of esthetic art, which we have called the fine-arts, and who make a business of producing kinds of pleasure for others, are called professionals. In general, a professional is one who claims to be such an expert in his industry that he can command welfare for himself by the production of an esthetic commodity. We might stop here to show how the lawyer or the judge is also called a professional, but it will be sufficient for us to notice that the term is applied in common usage to denote a high degree of excellence in an industry, and that it usually pertains to those

persons who engage in the fifth grade of arts, as we have designated them, namely, esthetics, industries, institutions, linguistics, and opinions. In medicine, the professional medical man is remunerated, not for the medicine which he furnishes, but for the opinion which he gives.

Thus, in the order of arts which depend upon the properties, the fifth property of consciousness gives rise to a fifth industry of welfare, which we call *medicine*.

The subject of medicine is fundamentally controlled by the five properties of human bodies and the organs which are developed severally for these properties. These are (1) the organs of metabolism or animal chemistry; (2) the organs of circulation or animal construction; (3) the organs of activity or animal locomotion; (4) the organs of hereditary genesis or reproduction, and (5) the organs of the mind or the nervous system. In order that the opinions of the medical man shall be of value, he must acquire a knowledge of the metabolic, constructive, muscular, reproductive, and nervous systems of the human body. This is fundamental.

Here it may be well to call attention to the organs of circulation in order to show that they are organs of construction, though motion is involved therein; for the properties are always concomitant. But when we consider circulation, we are considering it as the placement of the erythrocytes which are brought to the parts where they enter into construction. We are not considering the power by which circulation is accomplished, nor are we considering the motion of the particles as trajectories, but we are considering the constructive result which arises therefrom, together with the result which is produced in removing waste material. We are not considering how the removal is accomplished, but the results of the accomplishment.

For the sanitary knowledge which he must obtain, the medical man must acquire a knowledge of the substances which men use in continuing life on this planet—air, water, rocks, plants,

and animals,—and how they are kept pure from deleterious substances or conditions. This function of the medical man is of modern origin, and belongs solely to the scientific period of medicine. We have to thank the medical profession for a vast body of scientific knowledge relating to this subject. It is the glory of the profession that its most arduous labors, its greatest scientific discoveries, and its most enthusiastic pursuits are devoted to sanitation.

Remedial medicine has a long and interesting history. We have already seen, in the account given of Esthetology, how the fine-arts are involved in the superstitions of mankind when they also play an important role in the religions of the world. Now we have to see how these superstitions control the practice of remedial medicine. In every early society there is used a word which has the significance of "priest" as well as "doctor." The word "shaman" has come to be used as the representative of such words. We have already seen how esthetology was emancipated from religion. We must now set forth how medicine was emancipated from religion, for in the earlier stages of culture, when the opinions of mankind were mostly superstitions, religion essayed to control all human activities, and the priest was the dictator in every field of life; especially was it true of all those tribal and national organizations in which the head of the ecclesiastical body was also the head of the political body, and thus church and state were one. How this state of affairs originated we cannot here set forth in any adequate manner, but we are compelled to refer to it in treating of the subject of medicine, and to make a brief characterization of the nature of early remedies.

Here we must set forth the doctrine of what I shall call *imputation*. Imputation is the practice of attributing effects to erroneous causes, as when I impute the pain which I feel in my head to a spell which has been wrought upon me by a witch. A superstition is an opinion which a man may hold by reason of imputation.

Now, we are briefly to consider how this practice originated. Savage men always impute mind, or organized consciousness, to inanimate things, such as plants, rocks, the phenomena of water, and phenomena of the atmosphere. They also impute mind to the heavenly bodies, which they suppose to be molar bodies in the tent of the sky, which to them is the great wigwam of this world. If the savage strikes his foot against a rock and seriously wounds himself, he fails to attribute the accident to his own carelessness, but he imputes it to the rock itself, as being designed by the rock in order to injure him. Thus motives are assigned to all inanimate things, and events are brought about by others, animate or inanimate, which in fact are due to this activity. This is the fundamental phase of imputation.

Then tribal men believe that mind, which is a property of animal bodies, is a property of all bodies, and that this property is not a concomitant of the body and inherent in the body itself, but that mind is independent of body and can live apart from it, and when the mind leaves one body another mind may take up its residence there. This is the doctrine of ghosts as free, independent, and wandering minds.

There are many phenomena which to the savage mind lead to this opinion. I may briefly mention them: The phenomena of dreams, where men seem to go out of their own bodies and wander about the earth; the phenomena of ecstasy, produced by excessive mental or physical activity, where men seem to have visions of other times and places or to hear voices which do not speak in their ears; the phenomena of hypnotism, where men seem to see scenes which are not naturally presented to the hypnotized person; the phenomena of intoxication, where men believe they observe that which bystanders know to be not true; the phenomena of insanity, where the diseased person has thoughts which are erroneous, in which cases the savage believes that the ghost of another has taken possession of the invalid. The doctrines derived from these sources seem to be confirmed to the savage mind

by the phenomena of shadows and especially of echoes. Hence, in tribal society a ghost life is held in universal belief. Thus to imputation is added the ghost theory, or spiritism.

The savage man imputes the diseases which afflict mankind not to the bodies with which he peoples the world with animal creatures, but to the ghosts of these bodies. Hence we often find in a savage tribe that diseases are classified in a more or less vague way as the diseases of the stars, the diseases of the waters, the diseases of the rocks, the diseases of plants, and the diseases of animals. He does not consciously classify them in this manner, but he imputes them to the ghosts of these objects. When a patient is examined by the medicine-man, he may affirm that he has the elk disease, the bear disease, the wolf disease, the rattle-snake disease, or the green-snake disease, or he may say that he has the spider disease, or the fly disease. Especially are animals selected as the authors of ailments. I once witnessed the treatment of a child by an Indian shaman who claimed that its ailment was due to a little fossil abundantly found in the carboniferous rocks of Colorado, and known as *Athyris subtilita*. I have many times known colds to be attributed to insects, toothache to be attributed to worms, rheumatism to be attributed to snakes, fevers to be attributed to birds; but on careful examination I have often found that the bodies of these things were not held to be the authors of the mischief, but that their ghosts were the active agencies. Not always can this explanation be obtained, and sometimes the thing itself will be exhibited as having been extracted from the patient; but, in the case of the *Athyris*, the medicine-man claimed to me that, when he extracted the disease from the child, he put the fossil in his mouth before he performed the act of suction by which the ghost was extracted, and that his office consisted in extracting the ghost from the child and returning it again to the body of the fossil.

It may be worth while for me to state how widely prevalent is this doctrine of disease among the North American Indians. I

have found it myself among many of the Shoshonean tribes, which occupy a large area in the western portion of the United States; I have found it among the Wintun of California and many other tribes of the Pacific slope; I have found it also among the tribes of the Gulf states, and have never failed to find instances in any tribe among whom I have made diligent inquiry. Such causes for disease, however abundant they may be, must not be considered to be universal as they appear to the savage mind. The tribes of America rather seem to prefer to ascribe their evils to their enemies within the tribe, or still more often to their enemies in other tribes, when of course they believe in witchcraft. Especially are epidemics imputed to hostile tribes. The theory of the action of their enemies seems to be somewhat of this nature: that the shamans of the enemies have control over disease ghosts. But enough of this phase of the matter here.

In barbarism, which is the upper stage of tribal society, the theory of disease undergoes marked development; not that imputation is abandoned, not that ghosts play a less important role, but that a new group of mythologic beings is developed. These mystic personages are personified phenomena of nature which exist as divine personages, partaking in the affairs of mankind. While the hosts of savage mythology still exist in the popular mind, the leaders lay more stress on the doings of these nature gods. The nature gods are not supposed to be pure spirits, and to have a celestial home where they habitually dwell and where they are organized into a tribe of their own. Now, the same characteristics of imputation are found, the same ghost theory prevails; but in addition there appear a host of nature ghosts which also take part in the affairs of mankind by assuming the shapes of men and representing them on earth. These new deities play a special role in producing diseases among mankind, and their assistance is invoked to prevent and cure disease.

In a higher stage of culture, when tribes are organized as feudal dependencies about city governments which are ruled by

tyrants, and which I have called the monarchical stage of society, there occurs a marked development of the agency of the stars in the affairs of mankind, especially in determining good and evil, and still more especially in determining the state of health and the condition of disease observed on earth. Thus astrology is held to be the ranking science of the world. In this stage diseases are imputed to the stars and to their position, especially at nativity and in other important epochs in the lives of individuals.

Perhaps we have already said enough about the theory of diseases antecedent to scientific medicine. We now must consider briefly the theory of remedies which prevails in the savage, barbaric, and monarchical stages of culture.

In savagery, men find their remedies as they are revealed to them in dreams, ecstasy, hypnotism, intoxication, and even in insanity. In every savage tribe there are particular ceremonies and other means instituted by shamans for the purpose of invoking these aids to diagnosis, and especially of appealing to them for the discovery of remedies. The ceremonies which the medicine-men perform themselves for the discovery of remedies can usually be distinguished from those which they perform over their patients to secure the proper action of their remedies. In the one case ghosts are summoned to reveal the difficulties; in the other case the ghosts are commanded, abjured, begged, threatened, and in various ways induced to leave the body by ceremonial processes. But the shaman, to become such, must first drink his black medicine; he must summon his tutelary ghost by fasting and feasting and by dancing or by long and intense contemplation, by one or another or all of the agencies for opening the portals of ghost-land; and when the gates are ajar he communes with the spirits. Thus medical lore is acquired in these stages of society by dreams, ecstasy, hypnotism, intoxication, and even by insanity.

There are other methods of learning the potency of remedies.

There springs up in savagery a body of occult learning which is a doctrine of signatures, which comes down to the present time. Plants that have red juices act on the blood; plants that have heart-shape leaves act on the heart. In like manner all forms or fancied resemblances of plants and animals have a significance to the shaman as indicative of their medical potency. The world is ransacked to discover these wonderful things which cannot help but reveal their use to the shaman eye.

In early civilization the chemical transmutation of things seems to excite the greatest wonder, which leads to the development of a rude chemistry of transmutation. This new chemistry is alchemy, and the discoveries of astrology are met by the discoveries of alchemy. In this stage of culture, astrology and alchemy prevail as the lore of medical science, which is characterized by the emblems or signatures as they appear in astrology and alchemy. Could we enter into the subject, we could show how the potency of words or the formulæ of expression are now held to be of supreme moment. As poetry is now the fine-art of allegory, so medicine is now the healing art whose lore is taught in allegory. When science comes, the art of medical remedies is emancipated from the art of alchemy, astrology is divorced from diagnosis, and the shaman becomes either a priest on the one hand or a physician on the other. Thus religion and medicine are divorced. But neither religion nor medicine is at once freed from superstition. The progress is slow, and forever there is a war in both departments between science and superstition. How long, oh, how long will it last!

We return now to the consideration of scientific medicine, merely for the purpose of classifying the science, for we are in quest of the evidence by which we desire to exhibit the facts relating to the five properties of matter, and to show that the sciences are legitimately classified by considering the leading properties in a science as the characteristics of that science, and then to see if such classification warrants the conclusion that there are

but five properties of matter, and that in every body these five properties appear.

In medicine we are attempting to show that the fundamental property on which the science is founded is consciousness, from which are derived the opinions by which physicians serve their fellow men to secure their welfare. We have tried to show that these opinions require a special study of the metabolism, anatomy, physiology, reproduction, and nervous organization of the human being. In addition to this, there is required a special study of the environment of mankind—the environment of air, water, rocks, plants, and animals, including human beings, by which the individual is surrounded. We might have resolved the immediate environment to more remote conditions in the universe, but have contented ourselves with the immediate or proximate environment, rather for the purpose of showing that it is not necessary to make a final resolution of bodies and relations in order to discover pentalogic elements, although such elements appear whether proximate or ultimate conditions are viewed.

The physician must be informed not only about the conditions of health in these realms of environment, but also the conditions of disease in the same realms, in order that he may properly advise his patient for the benefit of his sanitation, or that he may prescribe those remedies which are best adapted to allay the evil effects of his environment. For this purpose he studies the etiology or cause of disease. He must first study the disease itself in its symptoms, and then discover the origin of the disease in unfavorable conditions. We may pass over the study of symptoms, and the classification of diseases themselves, for here we might antagonize contending pathies. Perchance, if I were quite honest, I would confess my inability to treat the subject as a medical expert. Then the physician must be versed in the causes of disease, and he discovers these causes in air, water, rocks, plants, and animals. Now, we might reclassify these agencies of disease, but the discussion would lead us too far from

our theme, for we are not writing a medical treatise, and it might lead us too far from our knowledge. Then we are immediately led to the discovery of remedies, and here again we strike upon the pentalogic substances which are employed as remedies, and show how substances, forms, forces, causes, and concepts are employed as remedial agencies. Here again we must stop, lest we enter into disputation and show our ignorance.

EXPLORATION OF ZAPOTECAN TOMBS IN SOUTHERN MEXICO¹

By MARSHALL H. SAVILLE

During the winter of 1897-'98 the American Museum of Natural History carried on explorations in southern Mexico under the terms of a concession granted by the Mexican government. Having been entrusted with the direction of the work by the President of the Museum, I proceeded to Mexico in October, 1897, and spent several months in Chiapas, in the field of ancient Maya culture, chiefly at the ruins of Palenque. Circumstances compelled me to leave the state of Chiapas, and it was decided advisable to investigate some of the remains of the little-known Zapotecan culture, not far distant from Oaxaca, the capital of the state of the same name.

The city of Oaxaca is situated at the junction of three valleys: to the northwest lies the valley of Etla; to the south the valley of Zachila; while to the east is the valley of Tlacolula, at the extreme eastern limits of which, at a distance of about ten leagues, are located the famous ruins of Mitla. Southwest from the city and not more than a league distant is the range of hills upon which are the remains of the great fortified city known as Monte Alban, which was probably the ancient Zachila, the capital of the old Zapotecan empire.

Tombs at Xoxo—Directly south from Oaxaca, two leagues away, is the little village of Xoxocotlan, in the broad and fertile valley of Zachila. It is occupied by pure-blood Indians speaking the Mixtecan dialect, who cultivate the land surrounding the town, and even the steep eastern slopes and level summit of

¹ This abstract, taken from field notes, is published by permission of the trustees of the American Museum of Natural History, New York.

Monte Alban. Within the limits of the town are several mounds, and from time to time objects of ancient art have been found in the *milpas*, which first called attention to the rich remains in this vicinity. Many of the objects have been obtained by Dr Sologüren, an enthusiastic and intelligent collector in the city of Oaxaca, who possesses the finest private collection of antiquities in Mexico.

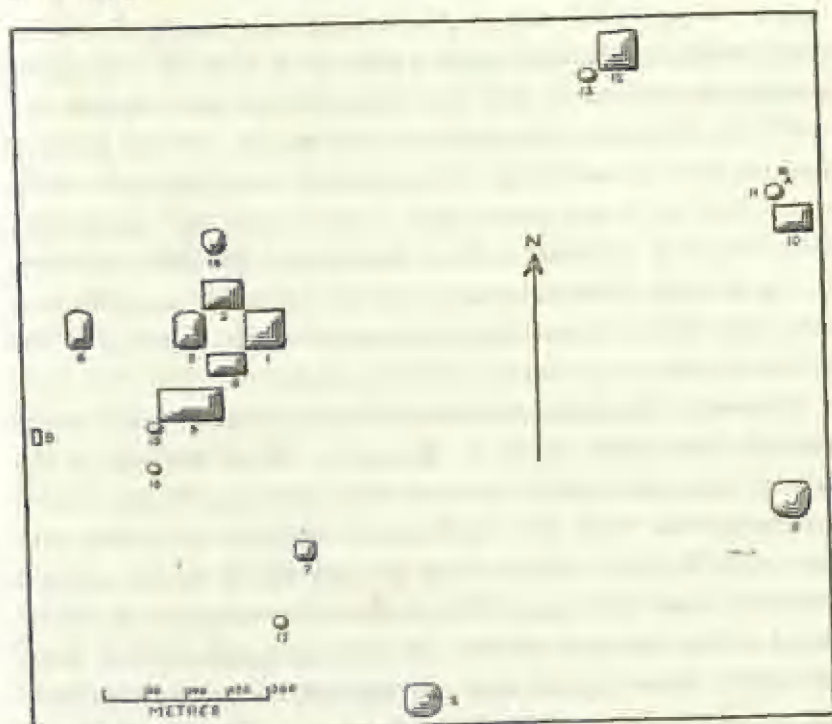


FIG. 8.—Plan of Distribution of the Mogotes of Xoxo.

Two miles south of the village is a group of mounds, locally known as the Mogotes of Xoxo, and connected with the main or central group are a number of outlying mounds. (See figure 8.) In 1886 Dr Sologüren made an immense excavation in the center of Mound 5, and discovered a remarkable tomb.¹

¹ The only account of Dr Sologüren's work which I have seen is that by Dr Ed. Seler, who visited the *mogotes* in company with Mrs Seler in 1888, and published a brief description of the excavation, and a drawing of the front of the tomb, in the

These *mogotes* are mounds of earth, of which there are seven in the principal group; four of these are arranged so as to enclose a large plaza or square, raised a few feet above the level of the surrounding plain. The sides of the *mogotes* are oriented. The eastern and principal mound (No. 1) is a pyramid about 160 feet square and about 60 feet in height. The northern and southern mounds (Nos. 2 and 4) are not so high and are rectangular in shape. Mound 5 has the greatest surface area, and is also of rectangular shape. Mounds numbered 4 and 6 have not the regular outlines of the others, and have been plowed over many times so that their original contour is now obliterated. Of the outlying mounds, Nos. 10 and 12 are of pyramidal form and quite steep, while Nos. 7, 8, and 9 are nearly circular, having been plowed over and their original outlines destroyed. Mound 7, however, at the present time is covered by a number of mesquite and guamuchi trees. Excavations were made in Mounds 1, 3, 4, and 6 of the main group without definite results.

Mound 3—The most extensive excavation was a 15-foot trench through the entire width of Mound 3. Near the top of the mound three terra-cotta cups were unearthed, two being without ornamentation, while the third was in the form of a foot with claws. At a slightly lower depth a small, rudely carved animal's head of stone was encountered, the only detached sculpture found during the excavations. At various depths cement floors and adobe constructions were cut through, and at the bottom of the trench, approximately in the center, several feet below the level of the plain, another cement floor was found, forming a step about 8 inches high with a stone edge. It is very probable that an excavation of the whole mound would reveal a tomb.

Mound 4—In Mound 4 a large cut was also made, and about six feet from the surface there was found a well-executed terra-

Compte-Rendu du Congrès International des Américanistes, Berlin, 1888, pp. 125-131, fig. 33. Dr Antonio Peñafiel reproduced a drawing of the tomb in *Monumentos del Arte Mexicano Antiguo*, tomo 2, pl. 132.

cotta figure representing a human body with a necklace, and having a tiger's head and limbs. This excavation was made from the northern side, about two-thirds of the distance through its width, and down to the level of the plaza. A tunnel was also made in the center about ten feet through hard adobe construction. A curious feature of the mound was revealed a few feet from the surface in the cross-section made by the trench. Three cement floors were found, one above the other and about one foot apart. Almost in the center, from east to west, these floors were found broken, and the northern part more than a foot lower than the southern, showing the whole northern part of the structure to have settled. This was probably due to the action of an earthquake, the region being subject to more or less severe disturbances of this nature.

Mound 5.—In this mound the tomb excavated by Dr Sologuren had been nearly covered by earth washed in during the rainy season. Past experience had shown the value of examining tombs which had previously been explored, and in this instance I was rewarded by the discovery of interesting material not reached by the former exploration. This tomb was in the form of a stone chamber about fifteen feet from the top of the mound, and was covered, from the upper part of the roof upward, by adobe constructions. The inner roof was made of nicely dressed flat slabs of stone, laid horizontally. The lintel was a long block of stone, on the outer face of which a fret was painted in red. Above the lintel were stucco decorations, the figure in the center being in the form of a crouching human body with the well-known Zapotecan form of mask. On either side were small heads, one representing an owl and the other a mask-face. Dr Sologuren found five large funeral urns in a row on the roof, just above the stucco figures, of the box-and-cover variety. The door of the tomb was sealed by a large square stone elaborately carved on the outer surface¹; in front of the

¹ This has been figured by Leopoldo Batres in *Arguologia Mexicana*, pl. 6, fig. 4.
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door was a small enclosure, with two steps leading upward on the sides directly opposite the door. The two side walls, three feet in height, were built against the front wall of the tomb.

It was found that the floor of this enclosure was not reached in the former excavations and that about a foot of hard-packed earth remained undisturbed. It was thickly strewn with objects apparently thrown in during some ceremony; all were covered with vermilion and the earth itself was highly colored.

Many shallow, saucer-like vessels were scattered throughout the enclosure; several small cups with covers and a number of perforated incense burners with hollow handles were dug out, not far from the front wall of the tomb. Fragments of an onyx jar showed traces of a stucco coating on which were painted designs in various colors. Fragments of human skeletons, such as hand- and foot-bones, as well as pieces of human crania, covered with vermilion, were found. In the northwest corner were twenty-six beads made of jadeite and Amazon stone; a number of human teeth had been thrown in, several of which are ornamented by the insertion of a circular piece of hematite, about three-sixteenths of an inch in diameter; several, also, are filed. These decorated teeth are the first that have been found in Oaxaca, but many of the funeral urns have the teeth filed, both in the representations of human faces and in the grotesque serpent masks. Portions of a number of pottery vessels were found on the floor. Dr Sologuren discovered no small objects in the tomb itself. In clearing out the crypt I found the skeleton of a dog, painted rose color, resting on the stone floor near the southeastern corner.

Mound 7—While this work was progressing, two Indians were digging a large hole at the southwestern end of Mound 7 in order to destroy some nests of ants, which were doing great injury to their crops. They discovered at the base of the mound a low stone wall, running east and west, several feet below the surface of their field. Rising from the wall at an angle of



TERRA-COTTA TUBING FOUND LEADING FROM THE CENTER OF MOUND T, XOXO, DOWN INTO THE FIELD

forty-five degrees was a covering of cement, which, at one time, probably enveloped the mound; it was in the form of an irregular dome with four square sides.

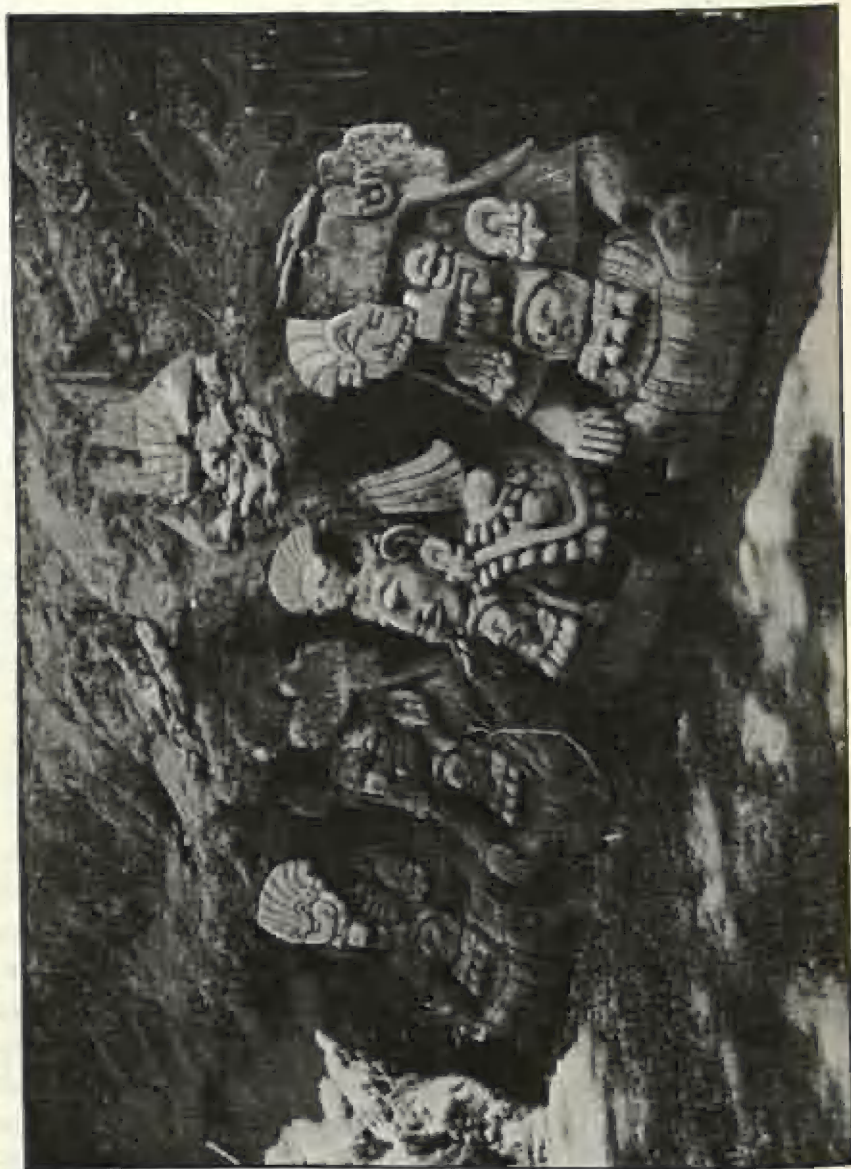
The attention of the Indians was called to a terra-cotta tubing or pipe which ran from under the cement covering, coming downward, and ending a few feet away in the field, perhaps three feet from the surface and ten feet beyond the stone wall. I made an excavation here and followed the tubing upward for thirty-six feet, until it ended near the edge of a cement floor. The character of this singular tube may be seen in plate XXI. It was laid in short sections, of varying length, one end being smaller than the other, the small end of one tube being fitted into the large end of the next. Several of the joints still preserved the cement with which they were made tight. The explorations did not reveal the use of the pipe. I learned from an Indian who has a *milpa* on the summit of Monte Alban, of a single section of tubing which he found in digging in the end of a mound near the eastern part of the ruins, which specimen is now in the collections of the American Museum of Natural History. I was informed by Sr Don Francisco Leon, Director of the Museum in the city of Oaxaca, that sections have also been found by the Indians at Zachila. No such terra-cotta tubing has ever been discovered elsewhere in Mexico, and a new problem is therefore presented. Near one of the sections of the tube was the cover of a beautiful portrait funeral urn, placed with the face upward.

The capping of cement covering the mound was traced upward, and was found to be covered by a foot of earth which has gathered there, and upon which is a growth of mesquite and guamuchi trees. About ten feet from the end of the tube, resting directly on the cement floor at the center of the mound, were five large funeral urns, representing seated figures, placed in a row facing the west. The urn in the center has a remarkably well modeled face, undoubtedly a portrait of some ancient

Zapotecan personage. The two on either side are of the same general size and character, with the exception of the face which is covered with a mask in the form of a grotesque face, possibly the conventionalized serpent, as the bifurcated tongue is one of the most prominent characteristics (plate XXII).

Five feet to the left or westward of the tubing, directly in front of the funeral urns, a curious oven-like structure was encountered, the top being just beneath the cement capping of the mound. We broke into this and found it to be a dome-shaped furnace filled with ashes, fragments of rude pottery, large numbers of burnt stones, many adobe bricks burned to a reddish purple color, also several fragments of metates and the handstones for the same. The walls of this oven seem to have been formed by the intense heat to which it had been subjected after being hollowed out of the solid earth and adobe of which the mound was constructed. This burning extended for ten inches and then gradually disappeared. It is probable that this was the kiln in which the funeral urns were fired; possibly others exist in surrounding mounds. Digging eastward, back of the funeral urns, at a distance of five feet, I came upon the front wall of a tomb, in the center of which was a doorway facing the west, sealed by a large, irregular stone. On removing it the chamber was found to be completely filled with earth which had fallen in owing to the destruction of the roof by an earthquake. Upon the roof-stones was a skeleton with several pottery vessels of the same general character as those which were found resting on the floor of the tomb, associated with several human skeletons. The falling of the roof unfortunately caused considerable havoc with the skeletons and pottery vessels, which were in the form of incense burners and pots for household purposes.

Mound 8—After completing the excavation in Mound 7, a trench was started in the center of the western side of Mound 8, and at a distance of fifteen feet from the beginning of the trench I discovered the front wall of another tomb. The door was



TERRA-COTTA FUNERAL URNS FOUND ON CEMENT FLOOR IN FRONT OF TOMB 1, MOUND 7, XOXO

covered by a large flat stone of irregular shape, and the corners were filled in with broken metates. Above the lintel of the door, in a niche, was a small funeral urn painted red, and the stones around this urn, as well as the lintel and sides of the doorway, were painted the same color (plate XXIII). Just inside the door were a metate and handstone, and, a few inches away, a line of food vessels extending across the chamber. Back of the vessels, near the center of the tomb, was a heap of greatly decayed human bones—the remains of four or five skeletons—which rested on the floor, and at least six inches of earth had silted into the tomb, partly covering the remains found therein.

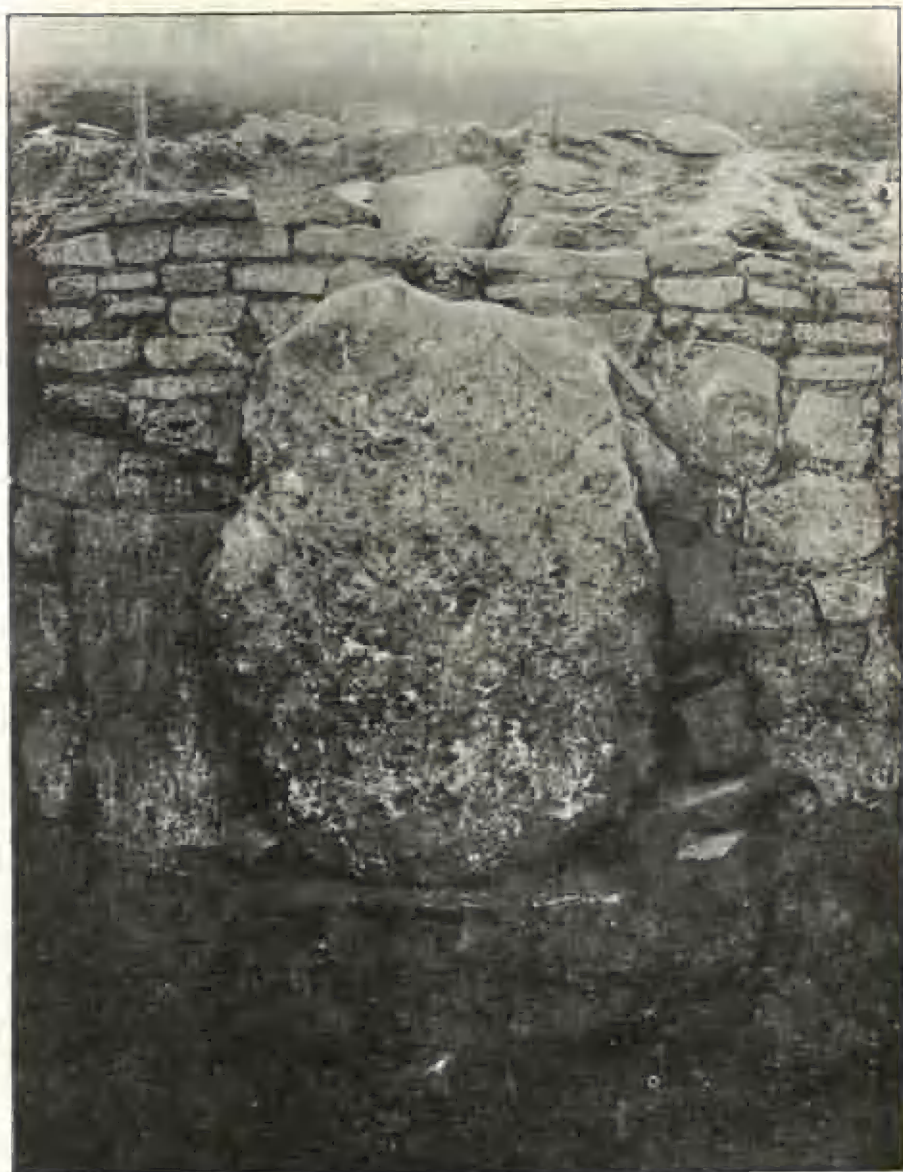
Another trench was started at the eastern side of this mound, and after working down to the level of the surrounding fields near the center of the mound just back of the tomb, there were found the scattered fragments of what will be, when restored, the largest specimen of terra-cotta ever found in America, and I do not know of so large a specimen ever having been found elsewhere. It represented a warrior, and the different pieces of the figure were scattered over a space of about fifteen feet. The central fragment was the head, upper torso, and right arm, lying face upward; the open mouth revealed the teeth painted white and filed, as in the case of the funeral urns. The eyes were well modeled and painted white and red; the head was covered with a turban of feathers, somewhat resembling the head-dress of Chac Mol, found by Dr Le Plongeon in Yucatan. A closely cropped beard covered the lower portion of the face, the upper part being pitted as though marked by smallpox. The ears had curious circular ornaments pendent by a string passed through holes pierced in the lobes. The nose was ornamented with a long cylindrical bead attached by a string fastened at the top and bottom through the septum. The breast was painted red and white and additionally ornamented with curious designs made by circular indentations. The legs, which lay quite separated from the body, were bare, and the feet were covered with sandals

having beautiful heel pieces. Around each ankle was a line of bells. Both the toe- and the finger-nails were painted white; the right arm, bent at an angle, grasped a pole or staff of which about a foot remained. These fragments are now in the Museo Nacional, City of Mexico. The entire length of the figure, according to measurements made of the detached pieces, was nearly, if not quite, six feet.

Mound 9—The most important excavation made at Xoxo was in Mound 9, where a trench was carried through the entire mound. Here were found cement floors and adobe constructions, as in the other mounds. As we worked from the western side of the mound to the center, a number of pottery vessels of different forms were unearthed; these were placed in a manner to indicate that they were thrown in while the mound was being made, probably as mortuary offerings. In one place, a few feet from the surface and beneath the uppermost cement covering of the mound, three human skulls were found in a row, facing the west, each covered with an inverted plate.¹

A little east of the center of the mound was a flight of stone steps leading down to a cement floor; the upper step was just beneath the cement covering of the mound. A few feet in front of the lower step was the front wall of a chamber, the most important tomb ever found in southern Mexico. The door was sealed with a large stone. The façade of the front wall was in the form of a frame, into which were placed five terra-cotta funeral urns, painted red; on either side of the one in the center was a death's head made of stucco. The face of each urn was protected by being covered with a plate or fragment of a jar, and in one instance with part of a terra-cotta box. These funeral urns, which had been fastened against the wall with cement,

¹ This custom of covering the skull with a plate has recently been described by Mr E. H. Thompson, in his memoir on the ruins of Xkichmook, Yucatan, published by the Field Columbian Museum. He found the skulls in stone chambers or tombs beneath the floors of ruined buildings.



FRONT OF TOMB 2, MOUND 8. XOXO, SHOWING DOOR SEALED WITH LARGE STONE, AND
SMALL FUNERAL URN IN THE NICHE OVER THE LINTEL

were the covers of boxes or chests of terra-cotta, resting on four feet, and the corners of each box were ornamented with symbolic faces. Evidently at the time the tomb was covered with earth, the boxes were thrown in, for I found their fragments in the excavation. On removing the large stone placed against the door, the floor of the crypt was found literally covered with food vessels and incense burners and the remains of several skeletons. The northern part of the floor was raised by the presence of a large slab of stone covering two-thirds of the area. At the inner end, on either side, were niches in the walls, each of which contained human remains. The compartment at the end of the tomb was filled with trunk and limb bones, over which the crania were placed, and all these bones and skulls were painted red. Several pottery vessels and incense burners were placed in front of the bones. Directly below the niches the wall was made by circular stones, one being on either side, and beneath the end niche two were placed side by side.

On the southern wall, just inside the doorway, was a large sculpture representing well-known forms of Zapotecan inscriptions. The walls of the chamber were formerly entirely covered with plaster, but during the lapse of centuries, probably accelerated by the action of earthquakes, the greater part had fallen off. They had been entirely covered with paintings in various bright colors, traces of which are distinctly visible. Over these bright-colored paintings a thin coating of stucco had been laid, upon which, in black outlines, were painted a series of human figures draped in flowing garments, the *tilma* of ancient Mexico. There were also complicated designs, possibly hieroglyphics. Many of the faces of the figures were further ornamented by a thin wash of red paint. The remains of these paintings, were they complete, would be of great value in a comparative study of the old Zapotecan codices.

The most important feature of the tomb was the hieroglyphic inscription carved on the stone door lintel, as giving an entirely

new form of writing from that heretofore known in Mexico, and the first ever found in Zapotecan territory.

In the earth in front of the door were many unadorned incense burners. Near the eastern end of the mound there was found a large funeral urn having the shape of a box with the cover, and resembling those which formed the ornament of the façade. A few feet distant there was encountered a low wall, rising from the top of which, at an angle, was a capping of cement which probably covered the entire structure after it had been completed, in the same manner as the capping formerly covered the tomb in Mound 7. Near the back of the tomb were uncovered a large number of terra-cotta cups, vessels, and small funeral urns, which, when the tomb was erected, had been deposited as offerings and covered with earth.

Tomb 4—In the fields, perhaps a hundred feet north of the large mound (No. 10), the Indians accidentally discovered, during my operations, a large flat stone. Clearing the earth from the edges we found it to be one of the roof-stones of Tomb 4 (A, figure 8), which was not covered by a mound of earth, but had been made by excavating several feet downward in the level field. It was covered by a cement capping which seemed to extend outward in all directions. The vault was long and was sealed by a large stone, in front of which was a small compartment with stone steps leading downward, as in Mounds 5 and 9. The roof had fallen in, and no remains of any kind were found in the excavation. The doorway faced the west.

West of Mound 3, in which the first excavations were made, was a large, low mound (No. 6) which I nearly demolished. A few inches below the level of the surrounding field was a cement floor, and in the general digging the remains of earthenware vessels and a few red-painted fragments of a human skeleton were taken out.

Several other experimental excavations were made with more or less negative results. One of these trenches, however, brought

to light a very interesting feature in the discovery of a house site. This excavation (B, figure 8) was made in the open field at a short distance from the main group. Several feet below the surface was a cement floor upon which was a raised platform of cement with a faced edge of cut stone. There was not sufficient time to complete this excavation, nor even to extend it as I had wished, but it was evidently the foundation of a dwelling, and it indicates the great amount of work necessary in order to thoroughly explore the remains of Xoxo alone.

Excavations in Mounds 10 and 12 would unquestionably bring to light tombs of perhaps greater interest and importance than those already discovered.

Conclusions

Summarizing in a general way the results of the explorations, the following facts are brought out:

1. The mounds of this group are burial mounds, containing stone vaults, the doorways of which face the west and are sealed by large stones.

2. Funeral urns are placed in series of five in front of the tombs, on the roof, or fastened into the façade.

3. These vaults are properly ossuaries or places where the bones of the dead were deposited. Tombs exist in Xoxo outside of the burial mounds. House sites may be looked for in the vicinity of the main group. The absence of stone implements is notable, only a single tiny arrowpoint and two celts being found.

4. The mortuary custom of painting the bones red, the placing of food and incense in the tomb, the interment of decapitated heads, the sparsity of personal ornaments buried with the dead, and the absence of decorated vessels in the vaults, are features brought out by these explorations.

5. The custom of filing and inlaying the teeth was practiced, and the use of hematite as an inlay was found for the first time.

This ancient custom can now be traced from the Pueblo region of Arizona to southern Central America.

6. The terra-cotta tubing found in the mound may perhaps be explained as serving some mythological purpose—perhaps to form an outlet for the escape of the shade of the dead. This explanation, however, is not altogether satisfactory, and further excavation in this region is needed to shed light on its significance.

7. The great importance attached to mortuary rites is shown by the elaborately constructed tombs containing mural paintings and hieroglyphic inscriptions. The terra-cotta figures and the funeral urns attest the very high attainment of the ancient Zapotecas in the art of modeling earthen objects.

8. The absence of anything like mosaic carving or patterns in the walls, such as are found in Mitla, is of great interest; furthermore, the mural paintings of Xoxo are widely different from those of Mitla. The excavations give additional proof that the ancient palaces of Mitla are not to be attributed to Zapotecan culture, but are the remains of a city built by the great Nahuatl tribe. This is further rendered probable by the fact that the character of the paintings of Mitla and those of the ruins of San Juan Teotihuacan, in the valley of Mexico, are practically identical. The tombs of Mitla, like the palaces, are constructed with walls having mosaic patterns.

The valleys of Oaxaca, Etla, and Zachila contain many groups similar to those of Xoxo, and of far greater extent; and as my work in Xoxo reveals a tomb of different character in each mound that was excavated, it is extremely probable that a great variety of new material for the study of Zapotecan culture will be brought to light by further explorations carried on in this territory.

STONE HAMMERS OR PESTLES OF THE NORTH- WEST COAST OF AMERICA

By HARLAN I. SMITH

The stone hammers or pestles of the northwest coast of America represent a variety of types of peculiar distribution. An examination of the specimens in the American Museum of Natural History, New York, reveals the following facts:

The different types of these hammers have many features in common. Their use for driving wedges causes many of them to have concave bases, while those used for rubbing have become but slightly convex on this surface. They usually have a well-defined head, which in general is cylindrical, and extends some

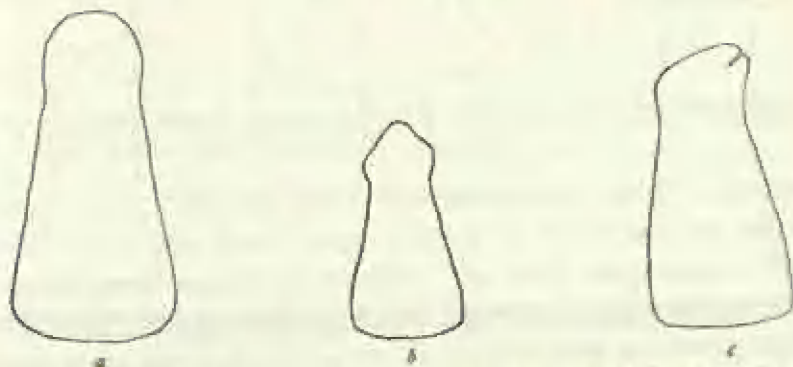


FIG. 9.—Forms of hammers or pestles from Thompson river valley, British Columbia. *a*, No. 16-2416, Kamloops; *b*, No. 16-2537, Kamloops; *c*, No. 16-2870, Spence's Bridge. (One-fourth nat.)

distance up from the base (figure 10). Rarely the body meets the base without such a head, except in those cases where the body is bulging (figure 9), instead of flaring toward the base (figure 12).

Each variety, so far as we know, may be assigned to a particular region. In the specimens from the valleys of Thompson river

and the upper Columbia (near Spokane) the body is conoid in shape, as shown in figure 9, *a*. The top is sometimes made in the form of a face or animal head (figure 9, *c*); frequently it is of hat-shape, as shown in figure 9, *b*.

In the valley of Fraser river, near Lytton, British Columbia, there is a type with a well-defined cylindrical head, larger than

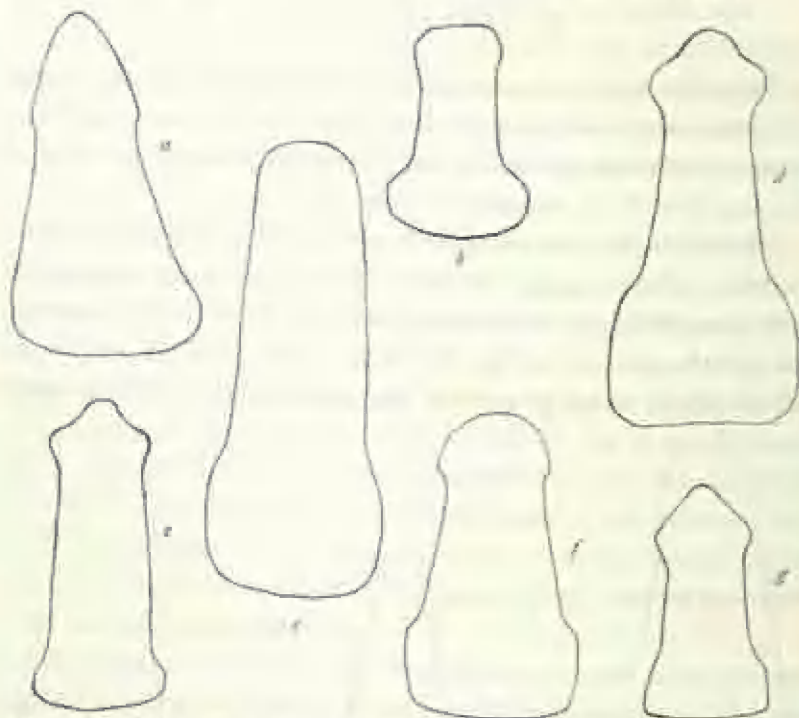


FIG. 10.—Forms of hammers or pestles from Lytton, B. C. *a*, No. 16-2924; *b*, No. 16-3222; *c*, No. 16-3222; *d*, No. 16-2924; *e*, No. 16-2926; *f*, No. 16-2927; *g*, No. 16-2926. (One-fourth nat.)

the tapering body, the sides of which meet the base at nearly right angles, as in figure 10, *d-g*. The prevailing form of knob at the top of the handle of this type resembles that of the Thompson valley type (figure 9, *b*), and it occurs also in Alaska. At Lytton is also found a conoid knob at the top of the handle (figure 10, *a*). Another hammer of this form (figure 11, *a*) has been found in the delta of Fraser river. In that region, however, many

types are in evidence, as one might expect, if it were visited by many tribes in the past, as it is at present.

On the western and northern parts of Vancouver island, the typical form of hammer is provided with a head at each end, the faces of which are nearly parallel, and the upper and lower ends somewhat alike, except that the latter is larger (figure 11, *b*, *c*).

In Alaska there are two types, one resembling the form found at Lytton, save that it is much more slender and tapering (figure 12), and the other having a handle like a flatiron, saw, or paddle



FIG. 11.—Forms of hammers or pestles from British Columbia. *a*, Fragment from Eburne, Fraser river delta, No. 16-2298; *b*, from Clayoquot, Vancouver island, No. 16-2294; *c*, from Fort Rupert, Vancouver island, No. 16-2226. (One-fourth nat.)

(figure 13). This type has a very short body, which resembles the head of the other types, and which might well be called a head, were we able to consider the body suppressed. The practically cylindrical body, which does not appreciably taper or flare, meets the slightly convex or concave base at nearly right angles, and never with a sharp, acute angle. Except in one case (figure 13, *c*) I have not seen a marked line between the body and the handle, the ends of which, in some cases, are ornamented with notches or human faces in relief. These hammers seem to have been used for rubbing as well as for pounding.

Specimens of the types found in the valley of Thompson river, at Lytton, and in lower Fraser valley, have been found in graves

not associated with evidences of contact with civilization, and accompanied with chipped stone arrowpoints and other things which indicate that they were made prior to such contact. Sev-

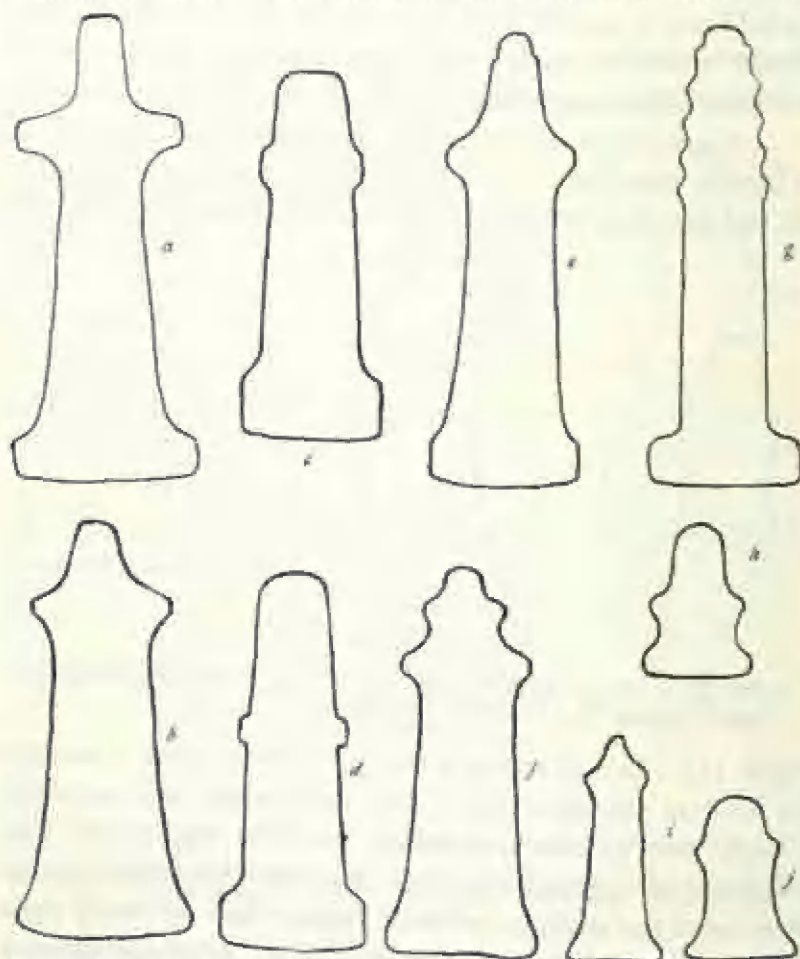


FIG. 12.—Forms of hammers or pestles from Alaska. *a*, Prince of Wales Island, No. E-33; *b*, Sitka, No. E-37; *c*, Yakutat, No. E-93; *d*, Chilkat, No. E-44; *e*, Chilkat, No. E-53; *f*, Sitka, No. 19-70; *g*, Chilkat, No. 19-82; *h*, Fort Wrangel, No. E-20; *i*, Sitka, No. 19-73; *j*, Auk, No. 19-74. (One-fourth nat.)

eral were found in a shell-heap in the delta of Fraser river, at considerable depth below many undisturbed shell-layers, over which was a stump of a Douglas fir more than six feet in diameter.

The curious handles of the Alaskan type—resembling those of

paddles, saws, and native adzes—are such as convenience might suggest. Since these hammers have many features in common with the prehistoric hammers of the northwest coast, the special-

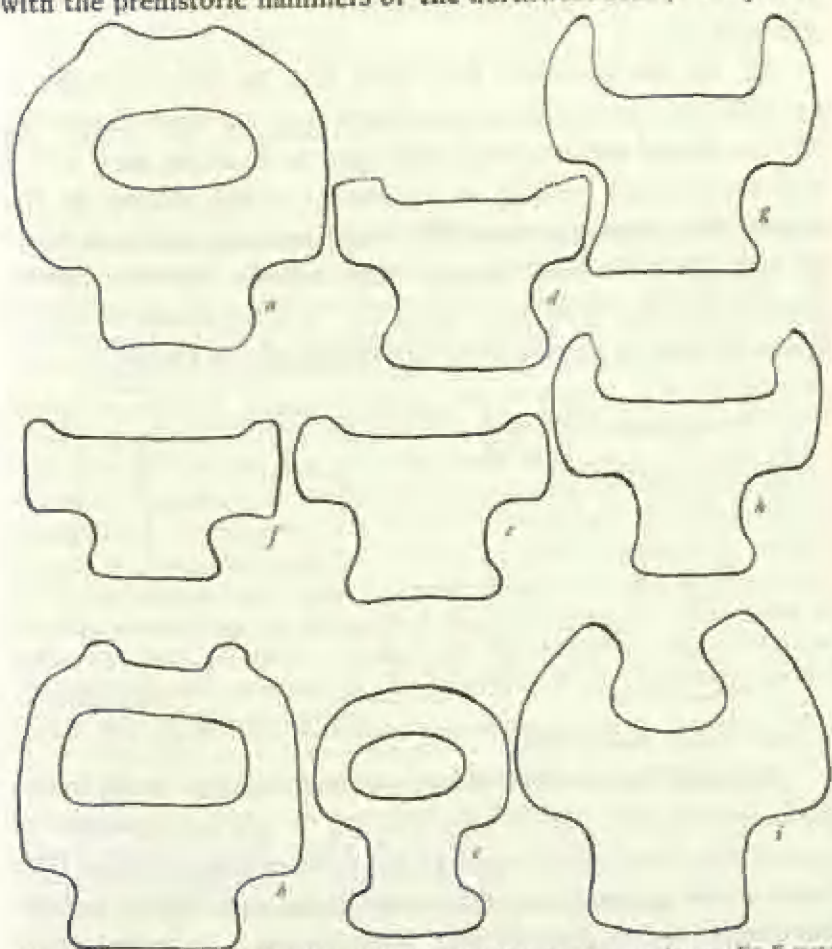


FIG. 17.—Forms of hammers or pestles from Alaska and British Columbia. *a*, Angoon, No. E-1943; *b*, Prince of Wales Island, No. E-98; *c*, Stikkeen river, No. 19-20; *d*, Juneau, No. E-45; *e*, Talcoo, No. E-47; *f*, Yakutat, No. E-94; *g*, Northern British Columbia, No. 16-164; *h*, Juneau, No. E-94; *i*, Tongass, No. E-1318. (One-fourth nat.)

ization of the handle does not seem to be sufficient reason for differentiating this form from the others. If this form of hammer were introduced from the Hawaiian islands,¹ as Professor Mason sug-

¹ In vol. 1, No. 1, p. 9, of the *Occasional Papers of the Bernice Pauahi Bishop Museum*, Honolulu, the specimens to which Professor Mason refers are described as coming from the Society islands.

gests,¹ it might be expected that it would not present so many differences from the *poi* pounders, and so many similarities to the three types of hammers described above and known to be old in America.

All the *poi* pounders that have thus far been brought to my attention, have very convex bases and no heads (figure 14). The bodies are slender, and always flare to meet the base with a very acute angle, forming an implement of bell shape. In this respect they resemble some Ohio and Kentucky pestles as much as they do those from Alaska. The handles resemble paddle-handles, but are much more graceful. A considerable variety of forms is found in certain groups of islands of the Pacific.²

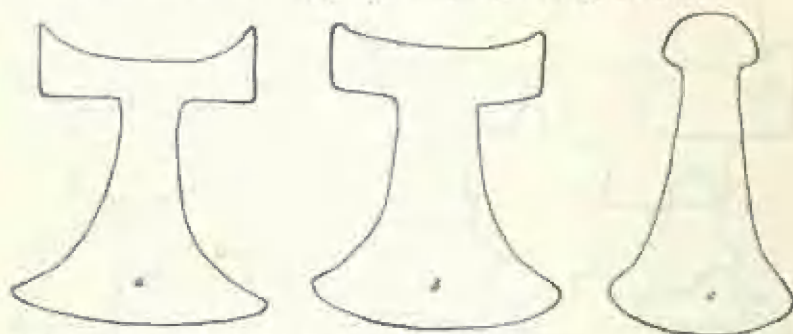


FIG. 14.—Forms of hammers or pestles from the Hawaiian Islands (U). a, No. S-5220; b, No. S-5221; c, No. S-5221. (One-fourth nat.)

Although the surfaces of some of the Alaskan hammers are disintegrated, and appear very old, yet it will be important to note if this form is discovered, as the three mentioned types have been, under circumstances that prove it beyond dispute to have been made before contact with white people. It seems hardly credible that the vast number of these curiously handled specimens, each of which required much patient labor, should have been made within the short period since Russian colonization; and we look forward with interest to more definite information on the subject.

¹ *American Anthropologist*, vol. xi, p. 382.

² Gill, *Life in the Southern Isles*, p. 204. Wilkes, *Exploring Expedition*, vol. iv, p. 48. Finach, *Ethnologische Erfahrungen*, pp. 206, 329.

ANTHROPOLOGIC LITERATURE

Die Sprache der Zimshian-Indianer in Nordwest-America. Von Dr
A. C. GRAF VON DER SCHULENBURG. Braunschweig: 1894. 4^o,
372 pp.

Dr von der Schulenburg has undertaken the laborious task of compiling a grammar of the Zimshian (Tsimshian) language from the translation of the Gospel made by Bishop Ridley. Anyone who has undertaken to study a language from material of this character will appreciate the labor involved in the task and the numerous sources of error that obscure the structure of the language. The translations, which are generally, as in this case, made with the assistance of somewhat educated natives, are never free from error, and often are inconsistent in the phonetic rendering or morphological interpretation of grammatical phenomena. It requires, therefore, an extraordinary degree of judgment and of caution to reach satisfactory results. While the present work bears all the marks of most painstaking industry, the author has not succeeded in overcoming the difficulties of grammatic interpretation. He has left his analysis so incomplete that the characteristic features of the structure of the language do not appear with sufficient clearness.

A discussion of the morphology of the language would require, first of all, an explanation of the fundamental morphological processes—reduplication, and word formation by means of prefixes and suffixes. The tendency to form words by means of prefixes is one of the most characteristic features of Tsimshian. Dr von der Schulenburg, unfortunately, has been misled by the lack of consistency in printing, prefixes often being represented as parts of words, often as independent words. He has accordingly treated the same subject in one place as a dependent prefix, in another as an independent word, thus creating a great deal of confusion in the simple structure of the language. Neither has he made an analysis of the functions of prefixes. It would seem that we may distinguish nominal and verbal prefixes. Purely nominal prefixes are either locative or adjective; or they transform verbs into nouns, such as prefixes for the *nomen actoris*, etc. Purely verbal prefixes are either prepositional or adverbial; or they transform nouns into verbs. One of the most striking features in the use of these

prefixes is the use of pairs of prepositional verbal and locative nominal prefixes; for instance, *ludhat gishga zumtemplega*, "he was in the temple" (*lu-*, in; *dha*, to be; *-t*, he; *gishga*, preposition; *zum-*, interior of; *temple*, temple; *-ga*, absence). Here *lu-* and *zum-* form a pair of prefixes. Another pair are *le-* (verbal prefix), on; *lak-* (nominal prefix), surface, top of. A number of very special ideas are expressed by means of prefixes; such as, stopping a motion, in darkness, actions done while in motion. Prepositional prefixes which merge into local adverbial prefixes are highly developed: on, in, towards, around, up, down, towards sea, inland, up river, down river, against. Some of these show nice differentiation of meaning: upward and downward along the ground, upward and downward in the air, into and out of from the side, into and out of from the top. Most of these shades of meaning have not been recognized by the author. The following translations of prefixes require corrections: p. 56, *klthna-*, prone; p. 57, *klthum-*, around an obstacle; p. 57, *bak-*, upward along ground; *man-*, upward through the air; p. 58, *tiki-*, down through the air; p. 59, *lthim-*, stopping a motion; p. 60, *ta-* (only in plural), extreme; p. 67, *gul-*; the examples given here mean partly *gul-*, empty (*gulwalp*, house without inhabitants), partly *tkul-*, against; p. 68, *gwan-*, near; p. 70, *ksh-*, extreme; p. 72, *oksh-*, out of from top. Here belong also the prefixes enumerated on p. 7, and many of those on pp. 84 ff., such as *gup-*, really; *shin-*, about; *lugwil-*, for good; *thim-*, much, very, real; *wi-*, great; p. 87, *zilum-*, into from the side; *logum-*, into from top; *yaga-*, down along ground (see above, *tiki-*); p. 88, *haldum-*; *agwi-*, outside; *sinsh-*, deserted; p. 91, *altha-*, in the dark; *haskha-*, already; p. 92, *lugwil-*, for good (see p. 85); p. 94, *gidi-*, right there; *shidi-*, often; p. 95, *alu-*, publicly; p. 97, *naga-*, each other; p. 98, *zum-*, in; *lak-*, on.

A number of so-called "formatives" which the author enumerates in this chapter are actually substantives; e. g., *zagash*, along, which evidently means, edge of; *havaklthk*, in front of; *lakau*, top of; *hagan*, place behind; *tkulan*, place behind; *awa*, proximity; *adup*, place opposite; *miyan* (p. 104), foot of tree. In short, in the chapter on formatives the most heterogeneous subjects are thrown together; and prefixes which belong together have been separated, so that the function of the prefix in the structure of the language is greatly obscured. Nor do we find any mention of the tendency of the language to form compound words embracing a whole group of prefixes: *shimaltha-lutikidoulth*, really to go down inside in the dark.

The function of reduplication is not set forth in full, except insofar as it relates to the formation of plurals. From an examination of the

examples given by von der Schulenburg, it would seem that reduplication does not form real plurals, but much rather distributives, as is the case in many American languages. Therefore we find it used for the frequentative of the verb, the simulative, and with the prefix indicating actions done while the subject is in motion. The phonetic laws underlying reduplication are not stated in the grammar, probably because Bishop Ridley's method of spelling does not bring out the fundamental fact of the existence of a hiatus between the reduplicated syllables and the stem. The principle of reduplication consists in the repetition of the whole word with shortened vowel up to the first consonant following the first vowel inclusive. Von der Schulenburg's "reduplication of last syllable" does not exist, but can be shown to be regular reduplication. While the number of classes of words that form the plural in various manners may be somewhat simplified, the whole subject of formation of plural is perhaps the most satisfactory in the whole book.

In the difficult chapter on the verb, the author does not show any very clear insight into the structure of the verb in American languages. The great paucity of tenses is striking, but the existence of a well-developed passive and the use of passives of transitive verbs for intransitive verbs, would have required much fuller treatment. But our principal criticism is directed against the treatment of the incorporated pronoun. There are two forms,—a suffixed form 1st p. s. *-ā*, 2d p. s. *-un*, 3d p. s. *-t*; 1st p. pl. *-m*, 2d p. pl. *-shim*, 3d p. pl. *-det*, and another consisting of prefixes: 1st p. s. *na-*, 2d p. s. *ma-*, 3d p. s. *t-*; 1st p. pl. *dup-*, 2d p. pl. *mashim-*. Even if the author was not able to find a clew to the significance of the two sets of forms, their existence and occurrence ought to have been explained. It would seem that the second form has a demonstrative significance, but the subject is not clear by any means.

The language has a strong tendency to indicate in verb, noun, and preposition the location of the action as visible or invisible, the former by the sound *d*, the latter by *g*. Von der Schulenburg uses for these forms the somewhat unfortunate term "article," while they would much more properly be called "demonstrative affixes." Particularly the preposition *a* has the tendency to take *d* or *g* as prefix, according to the location of the event. The last word of a sentence, or the verb very often, takes the suffix *da* or *ga*, indicating presence or absence; these, while phonetically identical with the preposition mentioned before, are purely demonstrative, and of a quite different origin. It is not correct to treat both as identical. The word *lin* is also called an article by the author, who thinks that it indicates persons who take part in an action

or witness an event. It seems that the word is generally best translated by the relative pronoun, and I am inclined to believe that it is a verbal noun with prefixed third person singular. In the reflexive pronoun the author does not distinguish the subjective form *lip* and the objective form *geluksh*.

One of the most peculiar features of the Tsimshian language is the use of connective suffixes for indicating the syntactical relation of parts of a sentence. There are two of these: *-sh* indicating the connection of the preceding part of the sentence with a proper noun, a term of relationship, or an independent pronoun, and *-lth*, indicating the connection with all other classes of substantives or pronouns. The incorporation of the pronominal object, which in many American languages forms the basis of the sentence, is only slightly developed in Tsimshian. The connective suffixes perform the function of this incorporation. The verb, which generally precedes the subject, takes the connective in order to indicate its relation to the subject. Prepositions, conjunctions, numerals, also take it; but adjectives, adverbs, and genitives that are not possessives or partitives take the connective suffix *-um*.

The second part of the book is taken up by a vocabulary, which is very inconveniently arranged, so that it is all but impossible to find the words that are etymologically connected. Furthermore, varieties of sounds that in the texts are distinguished by diacritical marks are arranged promiscuously. I add a few corrections to the vocabulary:

- | | |
|---|--|
| p. 202. <i>aiwál</i> , long time. | p. 214. <i>dash</i> , guts of bear. |
| p. 203. <i>shoakhíyá</i> , to come to increase. | <i>dhóhó</i> , to sweep (pl.). |
| <i>ltha d'akhíyáungushga aiásh-ága</i> , when the daylight increased. | p. 215. <i>díh</i> , to run away with. |
| <i>sha'alathgwísh</i> , to make weak. | <i>dó</i> , see <i>díh</i> , to sweep. |
| <i>algumgan</i> , to walk sideways. | p. 217. <i>mandukúgiw-</i> , to hold up. |
| p. 204. <i>alishk</i> , hardly. | <i>ámphuitk</i> , short. |
| p. 205. <i>awigaul</i> for <i>gumgaul</i> , only one. | p. 218. <i>áilumgá</i> , to take into. |
| p. 206. <i>lúshwá</i> , wrist. | p. 219. <i>gabáshk</i> , to kick. |
| <i>át</i> , cover, enveloping an object. | <i>gabaga</i> , cirrus clouds = cockle- |
| p. 207. <i>awimagaí</i> , "making all right." | shells of sky. |
| p. 208. <i>hahagunth</i> , to deny. | <i>gagá'ín</i> , to be sleepy. |
| p. 209. <i>hísh</i> , to tear. | p. 221. <i>gashashieph</i> , epidemic; <i>k-k</i> , accident. |
| p. 210. <i>hoyín</i> , take care! | p. 222. <i>gámuksh</i> , cape, made of wool of mountain goat. |
| p. 211. <i>whagumánk</i> , disgraceful. | <i>g'aphá'yek</i> , to blame = to turn over a long thing. |
| <i>dúsh</i> , to shrink. | <i>gashbagwúthkashó</i> , to go out about astray: <i>gashba-</i> , astray; |
| p. 212. <i>dalgaulishk</i> , to ponder over something. | <i>gwúth</i> , about. |
| <i>shodúth</i> , to throw away. | <i>gashbarkawúí</i> , to act without |
| <i>désh</i> , to measure. | |
| p. 213. <i>dáphunishk</i> , nail. | |

- knowing what one does.
- p. 223. *wale*, to carry on back.
- p. 224. *gaubunum ylla*, an eater; from *gaub*, uvula.
- p. 225. *gaukā*, maple.
- p. 226. *gaum*, soft.
- p. 228. *giaksh*, calm.
- p. 229. *whanahdshgum giit*, a pure man.
- p. 230. *hūgagigianāh*, man who is very particular.
- p. 231. *giim*, almost.
- gibisau'unt*, rear of home.
- p. 232. *gishgerhgun gaganu*, jealous.
- gishya*, to inherit, to go from one to another.
- gishwun*, to transplant.
- gitk*, raised.
- p. 233. *gōl*, to fall and break.
- p. 234. *gonwilg*, wound around.
- p. 236. *gulamian*, not to get what one wants.
- guldan*, away from the village, in the woods.
- gullamuksh*, to strew.
- gultkandak*, to sip.
- p. 238. *gunōk*, week, Sunday = well-dressed.
- p. 240. *gwashan*, pig (Chinook: *wechon*).
- p. 241. *gwāthgok*, to nod with the head.
- gwishiyum*, to lend on interest.
- gwunuksh antk*, pretense to be good.
- p. 243. *hagimuk-salk*, towel = to wipe face with.
- hagwālo*, rope.
- p. 244. *hah*, difficult.
- p. 245. *haldā*, to be bewitched.
- halimga*, sing; *hagymga*, to wipe with.
- halthan*, calico.
- mūg'dqs*, salmon berries.
- p. 246. *shūshum hanāh*, young girl.
- hanwilgwe*, to destroy.
- kaš'a'qs*, pole for canoe.
- hathandak*, to boil.
- p. 247. *hikul*, to persist.
- p. 248. *hido*, report.
- p. 253. *k'ā'maks*, cape, worn in rainy weather.
- p. 254. *kbiśh*, box (?).
- puśh* (instead of *kbiśh*).
- p. 255. *kām*, to become inebriated; *k-*, to eat; *ām*, rum.
- kithimush*, tin.
- kthipdalthdalth*, split all over.
- p. 256. *kshadēmuksh*, to squeeze out.
- kshaltkwalukshish*, water-mixed with something else.
- kshushishish*, to pull out.
- p. 257. *kshishsh*, came out of.
- p. 258. *kwanā'ir*, spring of water.
- p. 259. *kandamsh*, to squeeze in middle.
- kainish tagush*, to inherit = to take what is left over by death.
- lā'abel*, at once.
- lā'āk*, starvation.
- lag*, needle.
- lahil*, to stop, v. a.
- p. 261. *lūshink*, to wash all over.
- lāt*, snake.
- p. 262. *lanok*, rotten.
- lēt'id n*, a boll.
- p. 271. *ma'ol*, epileptic fits = like bear.
- p. 272. *milthik*, green = like leaf.
- mawata*, foolish = like land otter.
- p. 273. *mitkaksh*, sweet-smelling.
- p. 274. *mitāmāsh*, cow (Chinook).

FRANZ BOAS.

The Play of Animals. By KARL GROOS. Translated with the Author's Coöperation by ELIZABETH L. BALDWIN. With a Preface and an Appendix by J. MARK BALDWIN. New York: D. Appleton and Company, 1898. 12°, xxvi, 341 pp.

Although not nominally anthropologic, this work is of much interest to anthropologists; for man is preëminently *the* playing animal, and the

development of one of his most significant aspects can be traced only through the investigation of play among lower animals. One of Professor Groos's chapters—"The Psychology of Animal Play"—indeed indicates clearly the connection of his subject with attributes attaining their best development only in the culminating form of the animal realm.

The first chapter is a critique of the surplus-energy theory of play, commonly ascribed to Herbert Spencer, though the author attributes its origin to Schiller and credits Spencer only with its elaboration; the theory is discussed trenchantly and finally dismissed as unsatisfactory. Then comes a constructive chapter entitled "Play and Instinct," in which the author's special views are propounded and discussed with reference to the inquiries of others and to the conspicuous facts of animal conduct. Next follow two arbitrarily separated chapters on "The Play of Animals" in which a wealth of original and secondhand observation is assembled in such manner as to harmonize with, and strongly support, the author's conclusion. This conclusion may be summed briefly, yet perhaps fairly, in the statement that play is instinctive and prophetic—or, expressed in other terms, that play is a spontaneous expression of hereditary faculty which eventually attains full development in the individual through continued exercise. The fifth chapter (already noted as of special interest to the anthropologist) presents the mental aspects of animal play, explains the preponderance of play in youth, and compares the playful exuberance of animals and man in such manner as to set forth their relations.

The rendering into English seems to be admirable, while the value of the work is enhanced by the preface and appendix contributed by one of our foremost psychologists. The book-making is modest but excellent.

To the reviewer, the work of both author and editor seems highly commendable, and the results, so far as they go, quite acceptable; he would differ only in extending the conclusions further and expressing them more emphatically as a necessary part of the present fabric of science. In an address delivered nearly five years ago, he seriated the developmental stages of vitality, under somewhat arbitrary definitions, yet in such manner as to show that spontaneous action necessarily precedes maturely developed function.¹ This is true of everyday human activity, in which men *do* before framing rules of doing; it is true also of the animal realm in which, as Professor Groos so fully demonstrates, play presages the prosaic functions of mature existence; it is equally true in the vegetal realm, in which the tree springs upward before its form is shaped and its tissue conditioned by wind and

¹ *The Earth the Home of Man*. Anthropological Society of Washington; Special Papers, 2, pp. 3-5.

sun and environing organisms; and it is no less true of the mineral realm, in which affinity precedes combination. In a more recent address he took occasion to define activities in a certain order, and to indicate some of the reasons for regarding this order as normal and necessary, pointing out that "the primary activities of mankind [both ontogenetic and phylogenetic, and presupposing the antecedent organic development] are connected with more or less spontaneous sensations of pleasurable character."¹ Others have contributed to the subject, both before and since the issue of these addresses. Contributions of the first magnitude have been made by Powell in various publications, particularly in his recent epistemology,² in which the spontaneity of all primary action is not only recognized in the mineral, vegetal, and intellectual realms, as well as in that of animals, but is traced to fundamental principles; while the relations are explained by his rendering of the law of the persistence of motion—a rendering by which it becomes virtually a law of cosmic kinesis, illumining natural processes of every grade from chemic union to psychic action. It may be noted further that for some years the researches of the Bureau of American Ethnology have rested on a classification of the humanities in which the nascency of pleasurable activity is fully recognized. In this classification it is postulated, even more definitely than in the table with which Professor Groos closes his book (page 328), that those original and spontaneous functions which arise in play and mature in fine arts give character to the primary science of human activities, or esthetology; and the classification goes much farther than that of Groos's tabulation in seriating the several activities, maturing in (1) arts (including play and sports in their various forms), (2) industries, (3) institutions, (4) languages, and (5) opinions (including myths, beliefs, and philosophic systems).³ This statement concerning the extension and application of the principles formulated by Professor Groos is not designed as criticism, but is intended chiefly to indicate the soundness of his work and the strength of his position; at the same time it opens the way for an expression of high appreciation of the able manner in which he has brought together invaluable observations and records. His work is in the direct line of scientific progress, and marks a degree of advancement highly gratifying to his fellow-students.

W J MCGEE.

¹ *The Science of Humanity (Proceedings of the American Association for the Advancement of Science, Salem, 1898, p. 315. The American Anthropologist, vol. x, No. 8, August, 1897, p. 241. Science, vol. vi, n. 1, No. 142, September 17, 1897, p. 213).*

² *Truth and Error, or the Science of Intellection*; Chicago, 1898.

³ *Fifteenth Annual Report of the Bureau of American Ethnology for 1893-'94, 1897, p. xix. Sixteenth Annual Report of the Bureau of American Ethnology for 1894-'95, 1897, pp. xvi-xviii.*

Wild Animals I Have Known and 200 Drawings. Being the Personal Histories of Lobo, Silver-spot, Raggy-lug, Bingo, The Springfield Fox, The Pacing Mustang, Wully, and Redruff. By ERNEST SETON THOMPSON. New York: Charles Scribner's Sons, 1898. 8°, 358 pp., 30 pl.

At first sight this highly artistic book might seem even less germane to anthropology than the recent treatise by Professor Groos; yet on careful perusal it is found to deal, on nearly every page, with characteristics shared by lower animals and men—especially men of the lower culture-grades. Mr Thompson is a naturalist, as his record shows, an artist of notable strength and facility, as his effective picturing proves, and a writer of ability and skill (not to say genius), as his vivid and lucid sentences and the delicately woven web of each of his chapters testify eloquently; more than this, he has the instinct of the voyageur, the trapper, the shepherd, and the mahout for divining the hardly scrutable workings of the animal mind and sympathizing with their simple but strong emotions and passions; and perhaps above all else, he has the faculty of coördinating his singularly acute observations on animal activities in such fashion as to define the esthetic and industrial and social features of animality, much as the features might be defined by the animals themselves were they but able occasionally to reach the higher view-point and scan therefrom the lower plane of their actual existence. The book indeed is a revelation; it opens new vistas into cloudy commonplaces, investing long-neglected facts of everyday observation with new interest, and vitalizing the dull body of systematic (but purblind) notes on our bestial neighbors. The book is more than attractive reading merely; it compels recognition of the great fact that lower animals possess definite social attributes—that collective units exist among the beasts no less than among men. The animals studied by Mr Thompson had their collective arts—not only their youthful sports and gambols, but their more deeply studied comedies, often trembling on the grim verge of that tragedy on which the curtain always falls at last, for such is the law of the animal realm; they also had their industries, normally collective among the individuals of a group, only abnormally solitary; they had their social organization, in which craft and cunning, often combined with physical strength and grace, marked the leadership; they had their language, not only of voice and gesture but of lepine tree-mark and canine scent-record which their own kind and even some aliens might interpret; they had their system of education and occult discrimination and magnification of evil—in short, Thompson's birds and quadrupeds, biotic

organisms of the systematic zoölogist as they were, lived demotic lives just as do human savages and subjects and citizens. To the anthropologist the eight biographies of the book are of deep interest as showing the beginnings of demotic characters below the plane of humanity; they are of still profounder interest as indices of the way in which the human activities must have begun. Groos deals seriously with the lighter class of activities almost alone; Thompson treats not only of play but of work, in all its protean aspects, in luminously instructive fashion, albeit in lighter vein.

The book is elegant in technique, excellent in paper and print, and exquisitely illustrated by plates and abundant marginal cuts. There is no index. W J MCGEE.

Creation Myths of Primitive America in Relation to the Religious History and Mental Development of Mankind, by JEREMIAH CURTIN.
Boston: Little, Brown, & Co., 1898. 8°, xxxix, 532 pp., pl.

These tales, with which we were already familiar in the columns of the *New York Sun*, are now presented to us in the form of a handsome octavo. There are twenty-two altogether; thirteen of these were collected from the nearly extinct Yana, and nine from the Wintu, tribes of northern California. They are all interesting and instructive, and bear evidence of having been received from good aboriginal authorities. The only trace of European influence is found in the occasional use of English terms of measure, such as miles, hours, and bushels. But it is difficult for an Indian who knows the significance of these terms to avoid using them, since the native modes of conveying the same ideas involve much circumlocution. The author does not tell us the names or character of his informants, but we conjecture that the stories were told by Indians who spoke English.

It is feared that the title may prove misleading to many. We personally do not object to the expression "Creation Myths" in this connection; but it will not meet with the approval of those who define "create" as "to form out of nothing," or of those who see in the first chapter of Genesis a standard tale of creation. Creation is a long process, not yet completed. Many American myths attempt to account for the beginning, or at least the early stages, of this process; but these tales of the Wintu and Yana describe only the last stages. They are tales of metamorphosis; they speak of things already in existence, which are merely changed in form. It might be more proper to say they treat of completed evolution, for many of the creatures, before their final transformation, approximated the forms and characters which they now exhibit. The American myth-makers an-

ticipated the philosophy of Darwin. Again, some of the tales contain little or nothing even of metamorphosis, as, for instance, the story of Norwan which the author justly compares with that of Helen of Troy. The words "Primitive America," too, may lead many to expect a wider field of investigation than that of northern California.

Some of the accounts of metamorphosis are highly ingenious and have mythic reasons readily understood; but we cannot discern why the Yana should have selected the soft and brittle California buckeye as the material which Jupka transformed into their ancestors.

We miss some elements which are very prominent in other Indian myths. We find no ceremonial circuit, no certain evidence of a sacred number (although five and its multiples are most frequently found), and no symbolism of color. On the other hand we meet elements, too numerous to mention, with which we are familiar in the myths of other tribes. Our old friend Coyote frequently appears, usually in the character of a mischievous trickster who often comes to grief in the toils he has set for others. The author wisely gives us numerous particulars, apparently meaningless and foolish, which the less skilled or less conscientious collector might think unworthy of record. We may be sure that all these particulars have significance—they are not mere padding; they have reference to ceremonial work, to tribal custom or to natural phenomena which, if not explained today, may be tomorrow.

In the introduction, which is an elaborate essay on Indian myths in general, some conclusions are reached which are sustained by the legends of the Wintu and Yana; but not by those of other Indians.

WASHINGTON MATTHEWS.

The Magic of the Horse-shoe, with Other Folk-Lore Notes. By ROBERT MEANS LAWRENCE, M.D. Boston and New York: Houghton, Mifflin, & Co., 1898. 8°, iv, 344 pp.

The last essay in this book is entitled "The Luck of Odd Numbers"; it contains a section on the number seven and closes with this sentence: "Therefore it is doubtless true—and the truth should make us free—that the greater our indifference to the various alleged omens and auguries which so easily beset us, the more readily shall we acquire and retain a firm and enduring dependence on Divine Providence." Notwithstanding this wise conclusion, the author gives us just seven essays in all. "The Magic of the Horse-shoe," the largest and most important paper, occupies 139 pages. The other articles are: "Fortune and Luck," "The Folk-Lore of Common Salt," "The Omens of Sneezing," "Days of Good and Evil Omen," and "Superstitious Dealing with Animals."

The author somewhat disarms criticism by saying in his preface: "The expert folk-lorist may find much to criticise; but this book, treating of popular beliefs, is intended for popular reading." For all this modest declaration, we believe the expert will read the work with interest and profit, even if he finds in it little that is new to him or remembers illustrations which the author may have overlooked. We have noted some errors, but they are neither numerous nor important.

The following, coming from the pen of a physician, causes some surprise: "Moreover, saltiness has been thought to be an essential attribute of tears" (p. 169). If it is not *known* to be such, our textbooks on physiology have long deceived us. Is the author one "who never ate his bread with tears," or never otherwise tasted the lachrymal secretion? It would seem that the savages of California recognize the saltiness of tears. In Mr Curtin's *Creation Myths of Primitive America*, reviewed in this number, we find a Californian tale (p. 419), of one who wept a rivulet of tears, and at the place where he wept there is now a salt spring.

The author, following Eugene Schuyler's *Turkistan*, tells us: "When, also, any one hiccoughs, it is etiquette to say, 'You stole something from me,' and this phrase at such times is supposed to produce good luck" (p. 218). The reviewer conjectures that this may not be so much for courtesy as for cure. He remembers that in his childhood an old rural dame once relieved him of hiccough by accusing him of theft. After some moments of angry and indignant denial on his part and reiterated accusal on hers, she smiled and asked, "Where is your hiccough?" "It is gone," was the reply. "Yes, and I scared it off; I have often cured hiccough in that way," she said. He thought the cure was worse than the disease.

The work is well printed, tastefully bound, and presented, altogether, in the excellent style of the Riverside Press.

WASHINGTON MATTHEWS.

The Cross in Tradition, History, and Art. By the Rev. WILLIAM WOOD SEYMOUR. New York and London: G. P. Putnam's Sons, 1898. Roy. 8°, xxx, 489 pp., ill.

This sumptuous book is primarily ecclesiastic and devotional, and hence hardly to be considered or criticized from the standpoint of the scientist; so that occasional lapses, such, for example, as the introduction of an illustration from Squier, without reference to this well-known author either in the bibliography or in the index, may be passed over lightly. The keynote to the work is struck in the opening paragraph, which is a quotation from St Augustine; and this tone is

maintained throughout. One of the values of the book to anthropologists is found in numerous and often excellent illustrations of the cruciform and related symbols characteristic of the earlier culture stages, the cuts numbering 266. The work begins with a ten-page bibliography; the body is divided arbitrarily into three parts, and these again into thirty-nine chapters; it ends with a satisfactory index. Among the chapter-subjects may be noted "The Cross before the Christian Era and in Prehistoric Times," "Types of the Cross," "The Early Form and Use of the Cross," "Legends of the Cross," "The Cross in Early Christian Art," "Cruciform Ornaments," "Landmark Crosses," "The Cross in Heraldry," "Superstitions Concerning the Cross," and "The Sign of the Cross." The authorial part of the work was crippled by the death of the author shortly after the completion of the first draft of the manuscript, and again by the death of his literary executor (Rev. Thomas S. Drowne) before the proof-reading was finished; yet there are full lists of contents and illustrations, besides the bibliography and fifteen-page index. In this and other respects the publishers have done their part admirably; the book is handsomely printed in large type, with broad margins and inset side headings, and is thus comfortable for reading and convenient for reference.

W J MCGEE

How Music Developed, A Critical and Explanatory Account of the Growth of Modern Music. By W. J. HENDERSON. New York: Frederick A. Stokes Company. [1898.] 12°, viii, 413 pp.

This is a valuable contribution to the evolution of music, but it deals only with the evolution of modern music. The work assembles a large body of facts in convenient form for the ethnologist who pursues this subject. Not having studied music as it exists in tribal society, and hence having no adequate conception of primitive music, statements are made which to the ethnologist seem a little bizarre; thus, the author speaks of three stages of music, in which melody is developed first, then harmony, and finally rhythm, and he ignores that stage which the ethnologist knows as symphony, the last to be developed and especially characteristic of modern music. This he does by considering the elements of symphony as if they were elaborations of harmony. In all primitive music rhythm is rhythm of accent or stress: (1) It is rhythm of loud and soft; (2) it is rhythm of high and low; (3) it is rhythm of long and short; and (4) in symphony it is rhythm of theme, or perhaps it would be better understood if called rhythm of musical motive.

Our author well explains the development of theme accomplished by Wagner, though he seems to question the development of rhythm which Wagner accomplished; nor does he seem to understand fully the development of melody by the use of unwonted intervals, especially in the recitative. We may refer this last peculiarity of Wagner to his association with Helmholtz and especially with Engel. It is this introduction of unwonted intervals for which he is most bitterly criticized. It is affirmed by many that he violates melodic and harmonic rules and that hence much of his music is not music at all. But when the ear becomes accustomed to the new intervals, they are found to be exceedingly pleasing, and the passages which are condemned are at last considered to be the most delicate in musical expression. To the common ear, Arabic or Chinese is not music at all, but only noise; when at last the delicate intervals are appreciated, they are found to be very sweet. But all sweetness cloy, and the bolder intervals of Aryan music may still be defined as better expressing strong emotion, although the finer intervals of some peoples may well be introduced into Aryan music as Wagner has done.

J. W. POWELL.

Biologia Centrali-Americana, Archaeology. By A. P. MAUDSLAY. Part 10. London, January, 1899. 4°. Text, pp. 31-38; plates 74-93.

In Mr Maudslay's publication of the results of his explorations in the field of ancient Maya culture, Central American archeology has received its greatest contribution since the time of Kingsborough. Part 10 of this great work has just appeared, and completes the Palenque studies begun in Part 6 and continued in Parts 7 and 9. In this final Palenque part the description of the Temple of the Cross is concluded, and the Temples of the Sun and the Foliated Cross are also considered. The photogravure illustrations are of the highest character, while Miss Hunter's careful drawings, from casts and photographs, of the human figures laden with elaborate decorations, of the intricate symbolism, and of the hieroglyphic inscriptions, give us at last accurate material for study. Archeologists are now able to make exhaustive comparisons of the Palenque sculptures with those of Copan already published by Maudslay in the first four parts of his work.

The plates devoted to the initial series of glyphs (first recognized as such by Maudslay) and the two-headed dragon and water plant are highly suggestive, and the symbolism brought out in the latter could be thus seen only in the drawings; study of photographs alone would fail to reveal these forms. In the text Mr Maudslay has given the values of the initial series as worked out by the aid of Mr Goodman's

tables, published as an appendix to the work, which has appeared as Part 9. These values are as follows :

	<i>Temple of the Foliated Cross</i>	<i>Temple of the Sun</i>	<i>Temple of the Cross</i>	<i>Inscribed Steps</i>	<i>Temple of the Inscriptions</i>
Great Cycle.....	54	54	53	55	54
Cycle.....	1	1	12	3	9
Katun.....	18	18	19	18	4
Ahau.....	5	5	13	12	20 or 0
Chuen.....	4	3	4	15	18 or 0
Day.....	20 or 0	6	20 or 0	12	20 or 0
Named Day.....	2 Ahau	13 Cimi	8 Ahau	8 Eh	13 Ahau
Named Month....	13 Mac	19 Ceh	13 Mac	18 Tacc	18 Yax

This will suffice to show the great advance made in our knowledge of the contents of the graven hieroglyphic inscriptions since the appearance of the first number of Maudslay's monumental publication. It is exceedingly doubtful if we shall ever know much more about Palenque than what is now published. The present writer spent a number of weeks in Palenque in the winter of 1897-98 with the object of carrying on extensive excavations, but was deterred by the dense vegetation and the almost incessant rains which prevail during nearly ten months of the year. Laborers are scarce, and it is now almost impossible to procure them on account of the coffee plantations in the Tumbala region where all the laboring Indians near Palenque are employed. It is gratifying to know that the Mexican government has decided to remove all of the important tablets to the Museo Nacional in the City of Mexico. It is to be hoped that the parts of Mr Maudslay's work relating to Quirigua, Menche or Yachilan, Tikal, and other Maya ruins will be published as speedily as possible.

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NOTES AND NEWS

Philipp Johann Joseph Valentini, Ph.D., whose death occurred March 16, 1899, at Saint Luke's Hospital, New York City, was born in Berlin in 1824. His father was an Italian, and his mother a German. The father was a teacher of foreign languages, and the author of a German-Italian dictionary, which, at the time, was highly estimated for its accuracy. He was also tutor of the young scions of royalty at His Majesty's court.

The son Philipp was educated in the Lyceum of Rosleben and in the Gymnasium of Torgau. Later he studied jurisprudence at the University of Berlin, where he was appointed auscultator of the Supreme Court. In 1854 he went to Central America, and settled on the site of Puerto Limon, on the Atlantic shore of Costa Rica, where he founded the above town under government auspices. Learning that the Costa Ricans could give no account of their ancestors, he returned to Germany in 1858 to search for manuscripts and historical information regarding the colonization of this part of Central America by the Spaniards. The results of this study were embodied in a dissertation for which he received the degree of Ph.D. from the University of Jena. His early studies were influenced somewhat by his acquaintanceship with the great Humboldt, who was an intimate friend of his father.

In 1861 Valentini returned to Costa Rica, where he lived for eleven years, meanwhile establishing a coffee plantation. While living in Costa Rica, he made several trips along the coast, from the Isthmus of Panama as far north as Boca del Toro. Later he made a trip through Nicaragua and San Salvador into Guatemala, and there came into communication with the lamented Berendt. In Guatemala City he made researches among the manuscripts preserved in the Institute, and among other things discovered a portrait of the famous conquistador, Bernal Diaz del Castillo, which he published in the *Historical Magazine*, New York. At this time he completed his manuscript on the discovery and conquest of the ancient province of Castilla de Oro, the publication of which at the time was prevented by a revolution in Costa Rica; and this still remains among his unpublished works. His researches carried him as far as the famous Quiche ruins of Santa Cruz del Quiche.

He went to New York City in 1871, and we find him in 1879 engaged as an instructor of languages in the preparatory classes of the

School of Mines of Columbia University. About that time he began to publish monographs on the archeology of Mexico and Central America—the result of his devotion to these matters while in Central America. He began to expand his matured views and rich experiences in a series of remarkable works, which, though limited in extent, were welcomed by men of science. He had a good knowledge of the Maya language and less so of the Nahuatl. Both greatly aided him in his studies, although linguistics served to him only as a means of attaining scientific ends in other directions. His mental training was logical, thorough, and fundamental, and reflected the critical spirit which we find throughout in the higher institutions of learning in Germany. He stated his views frankly and fearlessly, as he thoroughly hated all ambiguity in life, in style, and in science. So were also his literary productions clear, painstaking, and to the point.

The Toltec nation which plays so important a part in the Spanish histories of old Anahuac, was a misconception, he declared; for the history of this people was partly mythical, partly a series of exaggerations, which sprang from the magnifying of rather insignificant facts. To make, as these Spanish writers do, a Mexican empire of the Toltec power, which is said to have preceded the "empire" of the Chichimecs, was just as unhistoric as to say that the governor of the present State of New York is the ruler, king, or emperor of the United States of America.

Quite a number of his monographs were published in the *Proceedings* of the American Antiquarian Society of Worcester, some being translated from German originals by Stephen Salisbury, Jr. The first noteworthy work on the archeology of Mexico was his study of the famous Calendar Stone, which was first delivered in German in the form of a lecture in New York City in 1875. An abstract was translated by Mr Salisbury and published by the Antiquarian Society. The original work is far more extensive, and remains among Valentini's unpublished writings. Of great importance was his argument against the calculiform Maya alphabet contained in Bishop Landa's writings, "The Landa Alphabet, a Spanish Fabrication," 1880. He demonstrated beyond all cavil that the Mayas never had any alphabet in our sense of the word, representing the isolated sounds of the language phonetically, but that Landa's characters form only portions of ideographic symbols.

Although the Maya calculiform script is still far from being solved, Valentini is to be considered as a pathfinder in this line of research for having dissipated many of the illusions and false theories bearing on



PHILIPP JOHANN JOSEPH VALENTINI

this relic of semicivilized antiquity. He was greatly interested in the history of the earliest discoveries of the Spanish and Portuguese explorers and navigators in America. His most extensive paper, "The Portuguese in the Track of Columbus," illustrated by many maps, was published in the *Bulletin of the American Geographical Society*, New York. His remarks on the travels of Pinzon, who first saw the mouth of Amazon river, were recorded and reviewed in the *American Antiquarian* of Chicago. One of his last publications belonged to this class, and is entitled "Pinzon-Solis, 1508," published in the *Zeitschrift der Gesellschaft für Ethnologie*, Berlin, 1898. His last work, now being published in the *Journal of American Folk-Lore*, is on the Trique Indians of the state of Oaxaca, which he read at the meeting of the Folk-Lore Society in Columbia University in December last.

The following list of Valentini's writings, from the *Proceedings of the American Antiquarian Society*, was prepared by Mr Salisbury, to whose sketch of Valentini's life, published as a note to the paper on the Mexican Calendar Stone, we are indebted for many of the facts presented in this brief notice :

A New and an Old Map of Yucatan, 1879.

Mexican Copper Tools. Illustrated. (*Proceedings of American Antiquarian Society*, 1879.)

The Katunes of Maya History. Illustrated. (*Ibid.*, 1879.)

Mexican Paper. Illustrated. (*Ibid.*, 1881.)

Two Mexican Chalchihuites, the Humboldt Celt and the Leyden Plate. Illustrated. (*Ibid.*, 1881.)

The Olmecas and the Tultecas. Plates and map. (*Ibid.*, 1883.)

Semi-lunar and Crescent-shaped Tools, with special reference to those of Mexico. Illustrated. (*Ibid.*, 1885.)

The Landfall of Columbus at San Salvador. Plate. (*Ibid.*, 1892.)

Analysis of the Pictorial Text Inscribed on Two Palenque Tablets, Parts I and II. Plates. (*Ibid.*, 1893, 1896.)

Das Geschichtliche in den mythischen Städten "Tulan," 1895.

Clay Figures Found in Guatemala, 1895.

Dr Valentini left a great number of manuscripts and notes, several of which are practically ready for publication. His most important contribution was an historical work on Costa Rica, bearing the title *Castilla de Oro*. This treats of the early history of Costa Rica, and it is hoped that it will eventually be published by the Costa Rica government. During the last three years he was engaged in making exhaustive studies of the migrations of the early Mexican people, finding analogies with their culture in Persia and Tibet. He was engaged also in a study of the origin of the astrological calendar, and claimed to have found its counterpart in Tibet. His knowledge of early

Spanish-American history was very extensive. In Dr Valentini's death American archeology has lost one of its most devoted and painstaking students.

A. S. GATSCHET.

The Voth Collection—Through the generosity of Mr Stanley McCormick, of Chicago, the Field Columbian Museum has been enabled to purchase the ethnological collection formed by Rev. H. R. Voth, the missionary to the Hopi or Moki Indians of northeastern Arizona. This collection was gathered by Mr Voth for the purpose of aiding him in his studies of and work among these people since 1893. Mr Voth's knowledge of the Hopi language and the studies he has made of these people, not only as a missionary but also as an ethnologist, enable him to furnish with the collection such information as will make it particularly valuable for the study of the Hopi Indians in general, and especially those of the pueblo of Oraibi. The collection will prove so much the more valuable as Mr McCormick has provided also the means for employing Mr Voth a number of months, during which time he will assist in preparing the labels for and in augmenting the collection by reproducing various altars, sand mosaics, etc.

Mr Voth's collection has been known to scientists interested in the Hopi for some time, and several efforts have been made to purchase all or parts of it, but the collector has hitherto refused to consider any offer in that direction. His health, however, making an extended leave of absence necessary, Mr Voth saw the necessity of having the collection deposited in a place of greater security than was possible in his home at Oraibi; he therefore finally consented to dispose of it. The collection is now being installed in the Field Columbian Museum.

Perhaps the first in general interest among the groups of objects is a collection of two hundred *tikus*, or dolls, representing the Hopi *katchinas* so far as they are known, especially those of Oraibi. In his studies of the complex question of the Hopi *katchinas*, Mr Voth soon discovered that many of the common *tikus* made by the Hopi are manufactured with little regard for accuracy, at least so far as the details of symbolism are concerned; hence many of the *tikus* were made to order in accordance with the true symbolic details of the personages which they are designed to represent. They are thus more accurate miniature reproductions of the *katchinas* than are those generally manufactured by the Hopi for sale. Secondly may be mentioned several dozen pipes of both stone and clay, including a number that have been used only in ceremonies (some of them for a long time), some used for ordinary social smoking in the kivas, and also a few found in house ruins near Oraibi.

Of religious paraphernalia the collection contains a great variety, including

kateina kilts and sashes, Snake-dance costumes, bridal and ceremonial robes, sacred water vessels, the different paints used, etc. Of unusual interest, also, are several dozen masks, some of which are quite ancient, and which, in connection with the Hopi masks obtained by the museum on a previous occasion, make this the largest and most valuable collection of Hopi masks thus far obtained.

Of ancient pottery the collection contains nearly five hundred pieces, including the corrugated varieties known as gray and black, as well as yellow, red, and plain ware, and also a few small selected specimens of modern pottery. The collection of objects of stone is of particular interest, as it comprises, in addition to axes, hammers, smoothing stones, corn grinders, etc., several dozen fetishes and idols, in both human and animal form, which have been in use by the Hopi for a long time, and such as are still used today. There are also two mask-forms, over which the bodies of the masks were stretched when they were made of rawhide.

Mr Voth has also made a beginning in the collection of different kinds of prayer-sticks (*pahos*), of which he finds a greater variety to exist than is commonly supposed. While the collection of these objects is not complete, it is the best that has thus far been obtained.

As Mr Voth has had in view a collection that would illustrate the Hopi in all phases of life, his objective material contains, besides the articles specially mentioned, many others illustrating the ethnology of these interesting people, such as ornaments of shell, stone, and other material; rattles, spoons, drills, and various other implements of horn and bone; bows, arrows, feather-cases, and other implements and utensils of wood; articles of clothing of different fabrics; trays, gourds, baskets, rattles, and other objects of vegetal material. The collection as a whole offers unusually valuable data for the study of the Hopi people, especially as the descriptions given by Mr Voth are based on intimate acquaintance with the language, customs, and religion of these people. The Hopi collection promises to aid very materially in further studies of and researches among these most primitive people of our country.

GEORGE A. DORSEY.

A Difference of Opinion—In his résumé of Prof. Ferdinand Blumentritt's studies of the Philippines, which appears in the January number of this journal, Dr Brinton says that "it will interest readers to learn that the Professor is positive that the Filipinos are sufficiently advanced to be capable of independent self-government, and it is his ardent wish that this shall be the outcome of our wresting them from Spanish misrule."

An contraire, Prof. Dean C. Worcester, one of the present Philippine Commission and author of *The Philippines*

Islands and their People, a record of his personal observation and experience during nearly or quite three years in the archipelago, is of the opinion that the civilized natives are utterly unfit for self-government, and that "their morals improve as the square of the distance from churches and other so called civilizing influences." G. R. S.

Zoque and Mije—The Mexican state of Oajaca is equal in size to about half the area of Pennsylvania, and is mountainous throughout. Within its limits reside a large number of civilized Indian tribes who speak many different languages belonging to several linguistic stocks. The most populous native group is the Zapotec, and next in order of number is the Mixtec, both belonging to the Zapotecan family. Other tribes are the Zoque and the cognate Mije or Mixe, whose territory extends into the adjoining states of Chiapas and Tabasco. The main Mije settlement in Oajaca is at San Juan de Guichicovi, where they have resided since very early times. The two villages called Chimalapa form the center of the Zoque population.

The dialects of the cognate Zoque and Mije were early studied by the padres, who introduced Christianity among them more than two centuries ago, the earliest Zoque grammar dating from 1672. The ancient *artes* and *vocabularios* contain a large number of terms, but the information which they render on the grammatic structure of the languages is limited. Still, we may gather from them that the noun undergoes little inflection, but that the whole predicative and inflective power is vested in the verb. The cases in English are supplanted in Zoque and Mije by postpositions; that is, prepositions placed after the nouns. Relative pronouns do not exist, but in their stead there is a relative particle, the place of which follows that of the verb. Raoul de la Grasserie, who has brought together all the existing material on the two dialects, shows that in the verbal inflection Mije places the subject pronoun before the verb, Zoque after it.¹ The root is monosyllabic in both; there is no objective conjugation with incorporative forms, but polysynthesis by particles inserted in the verb is rather predominant. The personal pronoun of Zoque closely resembles the possessive, but is not identical with it. The substantive verb *pots* enters largely into the inflection of the verb and there figures as a suffix. The numeral system is quinary, and in Mije all simple numerals from one to ten appear to be dissyllabic. Generally speaking, Zoque is more archaic than Mije, for it has preserved its words in fuller form.

A. S. GATSCHE.

¹ *Langue Zoque et Langue Mixe. Grammaire, Dictionnaire, Textes Traduits et Analyt.* par R. de la Grasserie. Paris: Malakouneve, 1896. 3^e, 384 pp. Tome xxii of the *Bibliothèque Linguistique Américaine*.

"The Growth of Toronto Children" is the title of a contribution of 60 pages, by Dr Franz Boas, to the recently published *Report of the Commissioner of Education for 1896-7*. It contains the results of various measurements of Toronto school children of both sexes, compared with those obtained in the schools of Oakland, California. When, in 1891, active preparations for the World's Columbian Exposition began, Prof. F. W. Putnam, director of its Department of Anthropology, placed Dr Boas in charge of the section of physical anthropology, and a plan was devised for representing as fully as possible the growth and development of American children. The article referred to is one of the results of this praiseworthy undertaking. A. S. GATSCHET.

New York Academy—The regular monthly meeting of the Section of Anthropology and Psychology of the New York Academy of Sciences was held Friday evening, February 24th. Two papers were presented by the anthropologists, one by Mr F. C. Spencer on the "Origin and Persistent Influence of Sacred Number Concepts"; the other by Dr Franz Boas on "Anthropometric Charts." Dr Boas gave an account of some of his recent investigations which seem to indicate that the anthropometric charts now used in the gymnasium and in anthropology are nearly worthless as a means of comparing the development of individuals. At the meeting of the subsection of Philology, Mr J. Dyneley Prince presented some notes on "Passamaquoddy Literature," and Mr J. C. Egbert Jr a paper on "Wax Writing Tablets of Pompeii." C. B. BLISS.

Deaths—Dr CAMILLE DARESTE DE LA CHAVANNE, professor at the École d'Anthropologie de Paris, and former president of the Société d'Anthropologie.

Rev. WILLIAM COLENZO, of New Zealand, distinguished for his studies of Maori antiquities and mythology.

Père JEAN-ANDRÉ CUOQ, of Oka, Canada, aged 78 years; a leading authority on the Nipissing and Mohawk languages, and the author of numerous works in or pertaining thereto.

At New York City, March 16, PHILIPP JOHANN JOSEPH VALENTINI, an authority on Central American and Mexican history and certain phases of archeology. An extended notice appears elsewhere in this number.

At New Haven, Connecticut, March 18, Prof. OTHNIEL CHARLES MARSH, Ph.D., LL.D., of Yale University, aged 68 years; former president of the National Academy of Sciences and of the American Association for the Advancement of Science; noted generally for his work in vertebrate paleontology, but among anthropologists was known as the

possessor of an unusually fine collection of Chiriqui pottery and gold ornaments, and as the author of several papers on anthropologic subjects, including a vigorous "Statement of Affairs at Red Cloud Agency Made to the President of the United States" in 1875.

The Salishan Indians form the most important family of aborigines in Washington and British Columbia, and indeed their settlements extend even beyond the boundaries of those sections on the north and east. On the Pacific coast the southernmost representatives of the Salishan stock are the Tillamook Indians of Oregon, who, though not a populous tribe, are of great interest to the ethnologist. Tillamook is a Chinook name, signifying "the people of Nekelim," which latter name in the Cathlamet dialect signifies "the place Kelim." The labial sounds were almost entirely lost from their phonetics and their cultural development was visibly influenced by the tribes of northern California. In the summer of 1890 Dr Franz Boas visited the Oregon coast and was enabled to gather a number of interesting myths, legends, and traditions, thirteen of which have recently appeared in the *Journal of American Folk-lore* (1898) under the caption "Traditions of the Tillamook Indians." The titles of some of the stories are: "The Thunderbird"; "Journey Across the Ocean"; "The Six Travelers"; "The Panthers and the Wolves"; "The Ascent to Heaven"; and "Asáyahal, the Warrior."

A. S. GATSCHE.

International Geographical Congress—In pursuance of a resolution adopted at the meeting of the International Geographical Congress, held at London in 1895, the seventh meeting of the Congress will be held at Berlin from September 28th to October 4th, 1899. The scope of the subjects to be discussed at the meeting is broad, including anthropogeography (industrial, commercial, and political geography) and ethnology, in addition to the general range of geographical science. Dr Karl von den Steinen, whose ethnologic researches in Brazil are so well known, extends a cordial invitation to all American ethnologists to attend the meeting, or at least to transmit papers for presentation. Manuscripts should be submitted not later than June 1st to The General Secretary, Prof George Kollm, 90 Zimmerstrasse, S. W., Berlin.

Pittier de Fábrega—In the January number of this journal, Dr Brinton, in reviewing the recently published work on *Die Sprache der Bribri-Indianer* by Dr H. Pittier de Fábrega and the late Friedrich Müller, expressed the hope that "Professor Pittier will be incited to still further researches in this productive field"—a hope that has doubtless been echoed by every student of American linguistics familiar with Pittier's valuable work. It is therefore to be deplored that on

January 7th, without warning, Sr Perez Zeledon, the Minister of Public Instruction, under pretext of economy, closed the Instituto Fisico-Geográfico at San José, of which Professor Pittier was director, and summarily dismissed its entire staff. As this institute was practically the only means afforded by the Costa Rica republic for the dissemination of knowledge regarding its wealth of archeology, ethnology, and linguistics, the wisdom of the minister's action is difficult of appreciation by students who have watched with interest the excellent results of Professor Pittier de Fábrega's directorship.

Brintoniana—Yielding to the suggestion of the late James C. Pilling, whose bibliographies of North American languages are so well and favorably known, Dr Daniel G. Brinton has recently published, for private distribution, "A Record of Study in Aboriginal American Languages" (Media, 1898, 8°, 24 pp). Even one not already familiar with the work of Dr Brinton along this line during the last forty years cannot fail to be impressed with the enormous amount of energy which he has expended in behalf of American linguistics, and with the high value of the results achieved. This personal linguistic bibliography, which aggregates 71 titles, comprises: I, General articles and works (15 titles); II, North American languages north of Mexico (14 titles); III, Mexican and Central American languages (32 titles); and IV, South American and Antillean languages (10 titles). It is hoped that Dr Brinton's next step in this direction will be a complete record of his non-linguistic studies.

British Association—At the Bristol meeting of the British Association for the Advancement of Science, a resolution was submitted to the council of the association, requesting further action with regard to the establishment of a Bureau of Ethnology for the United Kingdom, by renewing correspondence with the trustees of the British Museum. The council was also recommended to issue the collected reports on the northwestern tribes of Canada in a single volume, at a moderate price, reprinting as many of the reports as may be necessary. Sir William Turner, professor of anatomy in the University of Edinburgh, has recently been elected president of the Association for the Bradford meeting in 1900.

Siberian Archeology—In volume XXXII, numbers 1, 2, 3, of the *Memoirs of the Kazan (Russia) Society of Naturalists*, Dr S. Tschungunoff describes some deformed skulls found in the *kurgans* or burial mounds of Siberia. The article forms the ninth part of this authority's "Materials for the Anthropology of Siberia," the first eight contributions having appeared in parts 6, 7, and 10 of the *Proceedings of Tomsk*

University. The author describes two macrocephalic deformed skulls which were found in the Kainsk district of Tomsk, as well as three others of the same type from the Crimea.

Tolstoi Medals Awarded—The large Tolstoi medal of the Russian Academy of Sciences has been awarded to L. Besser and K. Ballod for their researches in the natality and mortality of the populations of European Russia, the Baltic provinces, and other sections of Europe, including Great Britain. The small Tolstoi medal has been presented to P. G. Matsokin for a manuscript work on the half-breeds of Transbaikalia.

Holland Anthropological Society—Through the efforts of Drs Sasse and Winckler, a Society of Anthropology has been established at Amsterdam, which has already enlisted among its members a sufficient number of active anthropologists to make the success of the new society assured. The officers are Dr C. Winckler, president; Dr Eugène Dubois, vice-president; Dr Sasse, secretary; Dr C. Kerbert, treasurer; Dr John E. Grevers, librarian.

Congrès d'Anthropologie et d'Archéologie Préhistoriques—A committee, of which M. Alexandre Bertrand is chairman, has been selected to organize the twelfth session of the Congress of Prehistoric Anthropology and Archeology to be held at Paris, commencing August 20, 1900.

Expedition to Siam—Mr W. W. Skeat of Cambridge University has departed from England with an expedition whose object is to investigate the flora, fauna, and ethnology of the southern portion of Siam lying north of the Protected States of Malay peninsula. The party will remain in the field about a year.

Sanscrit Manuscripts—Parts 8 and 9 of *A Descriptive Catalogue of Sanscrit Manuscripts in the Library of the Calcutta Sanscrit College* have made their appearance. The catalogues were prepared under orders of the Government of Bengal, by Hrishi'kes'a S'a'stri, second grammar pandit of the Sanscrit Collegiate School, and Si'iva Chandra Gui, M. A., B. L., lecturer in the same institution. They bear date 1897 and 1898 respectively.

Professor Flinders-Petrie, it is announced, has presented to the Museum of Anatomy and Anthropology at Cambridge, England, nineteen cases of skulls and bones from his excavations at Hieraconopolis. These include remains of the prehistoric and earliest dynastic races in Egypt.

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THE TREND OF HUMAN PROGRESS¹

By W J McGEE

One summer noonday in early youth I approached the verge of the bluff-line overlooking the Mississippi midlength of its upper course, and for the first time looked down on the broad Father of Waters. Southward the shimmering surface stretched away between bordering bluffs with a belt of bottomland on the farther side, until it faded in the distance; northward it soon disappeared beyond a bold headland; but I already knew from the books and from the talk of my elders that it was a river. The sight was an inspiration, and left lasting impression. An hour afterward I was at the brink, vaguely disappointed to find the half-idealized thing of majesty nothing but muddy water lapping lazily against a crumbling beach. Recalling my preconception of the river, I scanned the breeze-troubled expanse to see which way the waters flowed; but in vain. Turning away, I saw a group of urchins lounging on a low lumber-pile, and, approaching in due awe of the superior wisdom and prowess of the city boy, I inquired of these long-time residents on the river bank

¹ Address of the President of the Anthropological Society of Washington, delivered before the Washington Academy of Sciences and affiliated societies, February 28, 1899.

which way the river ran. The voluble lad with feet nervously dangling from the edge of the lumber-pile answered promptly, "Huh! it don't run nowhere; it stays right there." His nearest companion, prone on stomach with chin in hands and heels wagging slowly in the air, answered more deliberately, "In high water it runs all over here." The chubby boy lying on his back with hat pulled over his eyes chimed in with the confidence of experience, "It runs agin the boat; jist you try it and see." Next the pallid youngster crouching on the farther corner of the corded boards piped up, "My father says it runs to St Louis," only to be suppressed by the ragged, red-haired urchin lying in a heap on the center of the pile with the ultimatum: "Hey? Well my dad says it runs right up yonder past Eagle Point to St Paul; and I reckon he knows!" Then the scientific inquiry was brought to a close by the more pertinent and important query in return, "Have ye ary white alleys?" But the lesson was not lost; I had learned how hard it is to find which way the current runs; I had learned, too, the worthlessness of the opinions of idlers.

Later I looked down on the stream of human experience with interest no less than that excited by the first sight of the Mississippi; I scanned the waves and eddies raised on the noble river by the breezes of conflicting opinion, and strove to separate them from the steady current below; and I inquired of the loiterers on the banks of this stream, no less hopefully than of the loafers on the long-ago lumber-pile on the Mississippi, as to the trend of the current. Not always have my guides agreed. When I asked of the past and future career of our planet, some held it to be slowly approaching the sun with a certainty of ultimate absorption in the fiery mass, while others considered it a slowly refrigerating body bound to lose its vitality neath a mantle of ice; I do not know which is right, and half suspect both guides to lack the experience needed to decide. When I first inquired the course of vegetal and animal life, I was met by the

confident declaration that there is no current—that the vital forms were fixed by fiat in the beginning to persist unchanged for ever and ever; later a red-skin man, full of the lore of his race, assured me that the animals of the long ago were vastly larger and wiser than the present pygmies, and that the future darkened toward annihilation; but afterward actual workers in experience of vitality mirrored that experience in their own minds, and pointed out a trend of vital development from the low toward the high, from dulness toward brightness, from mindless groveling toward intellectual uprightness. When I sought the current of human progress my earlier guides averred, with a conviction transcending experience, that man began little lower than the angels, and—save for an elect few—was lapsing toward the depths of eternal despair, or perchance drifting toward the annihilation awaiting the beasts in the dusky philosopher's gloomy faith; other guides were hopeful that those of their cult might possess the earth; but until within half a lifetime there were few who had the courage to stem the stream of experience with respect to man himself and learn the actual set of the current. The direction of flow of the Mississippi might have been learned from practical boatmen; and it is meet to inquire whether the trend of human progress may not be gained from actual workers in man's experience of Man.

The scientific study of Man grew out of research among lower organisms; and at first the lines and methods of inquiry in biology and anthropology were alike. Gradually the searcher perceived that the genus *Homo*, albeit animal, is something more. At first he feared his distinction was but a vestige of the classical division of the genus into the real species *sapiens* and the mythic species *brutus*, or else an echo of the medieval exaltation of spirituality, and so he touched lightly on those essential and fundamental features that demark man from his ancestral brutes no less strongly than these are demarked from the min-

eral substance of which their bodies are built; but prolonged experience forced the conviction that mankind must be viewed by the scientist, no less than by the idealist, as an essentially intellectual entity, and the possessor of social and moral characters reflecting the fundamental intellectuality. Next it came to be recognized that the unit of anthropology is not merely the individual body, as the animal body is the unit of zoology, but the social group, and this advance marked the birth of anthropology in its full sense; for the object-matter of the science is not so much man as men, not the *somatikos* so much as the *ethnos* and *demos*, not the person so much as the family, the clan, the tribe, the municipality, the state, the nation, the culture-group—indeed any assemblage, or all assemblages, of men. Now, the recognition of the essentially collective character of mankind was but the swinging of aberrant and idle opinion into the current of the stream of experience—for it is the function of science, the highest yet simplest form of knowledge, to resolve individual experiences into their true components and to bring ever-varying opinion into harmony with the invariable course of nature.

Recognizing the collective assemblage as the basis of his science, the anthropologist was nevertheless impressed by the variable structure of units constantly changing with birth and death of individuals, with migration and readjustment to new conditions, with the blending of groups and peoples, with discovery and invention; and he was soon led to see that the structure of the unit is less important than its activities—and thereby to raise his science to the plane of dynamic interpretation. True, he had the example of the other sciences before him, yet he pressed forward so rapidly as hardly to note their precedence until his passage was made; astronomy spent three millenniums in passing from astrology to formal description and thence to interpretation in terms of molar and molecular motion; chemistry dragged drearily from alchemy up to Avogadro and above before the physical basis of the science was fixed; biology rested in formal-

ism for centuries before Darwin established the ideas of generative forces and sequence; even youthful geology has passed most of its history in formalism, and is only today emerging into the full light of interpretation in terms of agency; while anthropology has occupied barely two decades in rising from the first recognition of the essentially human unit to the classification of mankind in terms of human activities—a period so short, indeed, that some have failed to keep pace with the advance.

Most of the makers of the modern science of man still live, some of them now listen; it might seem invidious to offer them due meed of tribute; but it cannot be held invidious, in this presence, to note that the Anthropological Society of Washington was the first institution to follow the epoch-marking advance and adopt an organization based on the primary activities of mankind.¹ In taking this step our members but synthesized experience covering a wider range than their predecessors enjoyed—the experience of long and intimate association between the white race, the red race, the black race, and some of the yellow race, as well as the unique experience of actual contact between the four grades of culture represented in savagery, barbarism, civilization, and enlightenment. So the tribute some of us would fain pay our progressive pioneers must be tempered by appreciation of the favorable conditions attending their pioneering; for he whom fortune favors with experience of four races has a more than double advantage over the student of but two, while he who is favored with experience of four culture-grades has still greater advantage over the student of any lesser number, and he who scans at one view the field of four races and the series of four culture-grades sees the sum of human experience in single glance and, holding immeasurable advantage over the surveyor of narrower fields, might well blush to make no further advance.

¹ On January 17, 1899, the sectional organization of the Anthropological Society of Washington was reconstructed, and the number of sections increased from four to seven, viz.: *A*, Somatology; *B*, Psychology; *C*, Eathetology; *D*, Technology; *E*, Sociology; *F*, Philology; and *G*, Sophiology.

The founders and renovators of our Society have sought merely to conform the opinion expressed in their organic law to all recorded and remembered and inherited experience of men with respect to mankind. Their latest step is not their first pioneering; but should increased knowledge prove it ill-directed, it will be their first failure in defining and forecasting the rapidly growing Science of Man.

There are certain fundamental modes of arranging and interpreting the facts of nature which seem to arise in a certain order; they seem also to reflect the spontaneous operations of the human mind, and thus to embody the sum of human experience and epitomize the history of knowledge. (1) The simplest arrangement is numerical; it involves no acute or continuous observation, no discrimination save the most superficial, yet it easily expands so widely as to engage the full faculty of the student of nature in its external aspects; it matures in arithmetic, the earliest of the sciences and in some measure the foundation of all. (2) As the numerical arrangement is found too meager to express observed relations, an orderly arrangement in which relative position, or form, or size, or structure, or all of these combined, is superadded; this arrangement, or interpretation of relation in terms of space, involves increasingly acute observation and discrimination, and growing power of abstraction, but does not necessarily involve continuity in observation and ratiocination; it is expressed in the higher mathematics, in geography in its protean aspects, in all the descriptive sciences and aspects of science—its key-note is *graphos*. The two methods easily blend in that formal knowledge, or static interpretation, which marked the beginning of every branch of science. (3) As the numerical and formal experiences multiply into chaos, the mind spontaneously gathers its forces: observation is sharpened and prolonged, memory and reason are strengthened, experiences are sifted and synthesized intuitively, and at length the barrier to

advancing knowledge is leaped—and an arrangement or interpretation of things in terms of motions or powers is superadded in turn; then graphos becomes logos, observation is refined and grows into generalization, ratiocination is established, and the mind feels its power and begins the conquest of nature with the twin organs of hand and brain. (4) As knowledge grows, the numerical and formal and potential interpretations become too complex for convenient use; but it is an easy step from the arrangement in terms of motion to arrangement in terms of sequence, and this step has been taken in the several sciences in at least some of their aspects, including anthropology save in certain aspects—for while every anthropologist now recognizes the bestial ancestry of mankind, the increasing capacity of the cranium, and other features pertaining to the biotic development of the human body, there are some who have not yet been led to note the concomitant and much more significant demotic development of intellectual man. The third and fourth modes of arrangement of things easily unite in that dynamic interpretation which is the distinguishing feature of modern science, giving character to the New Astronomy, the New Chemistry, the modern biology vitalized by Darwin, the New Geology, and the anthropology of this Society. (5) There is another mode of interpretation, spontaneously yet only half-consciously essayed by many observers, in which the mind is held to be a reflex of nature, at once the product of experience and the guide to the invariable procession of events in nature; it is but the normal synthesis of the numerical, formal, potential, and sequential arrangements, and would seem, in combining these, to attain the acme in completeness of interpretation. It was formulated by Bacon as the key-note to his *Novum Organum*, the mentor of modern science, and after centuries of singular neglect has been reformulated and brought up to the present state of knowledge by one of our members in a new organon which time must test.

Regarding the successive modes of interpretation as stages in

the progress of knowledge, the position of anthropology in America, and especially in the Anthropological Society of the National Capital, is definitely fixed. We are long past the numerical stage in which the individual body is the unit, well past the formal stage in which organic and even superorganic structure marks finality, fairly advanced on the stage in which superorganic or collective activities form the bases of our work—so well advanced, indeed, that it is easy to forecast the transition from the merely potential interpretation to the sequential arrangement in which families and tribes and nations and cults and culture stages will be considered and classified genetically, as things that arise and pass like the plant, leaving ever the germs of new (and mostly better) organizations. The organization of the Society is well above the formal or static plane, well within the higher grade represented by the New-Science family; and it is the chief purpose of this writing to suggest the short and easy step from the potential interpretation embodied in our law to the sequential interpretation which must mark our next advance—unless the history of scientific progress is a delusion.

Recognizing the collective character of the human unit, and realizing that the human activities form the best basis for the classification of the human kind, it is but natural first to note and next to trace the growth of activital products, and then to note and trace the development of the activities themselves. No mind is too idle to note the shaping of the horseshoe under the hammer of the smith, and no thinking observer can resist passing to the skill of the smith and then to the growth of smithing itself, though he may be (indeed, commonly is) diverted before his mind has long followed its normal path. The idea of the collective unit may be likened to that of the iron and coal and tools, the material requisites for the making of the horseshoe; the idea of the potential factor may be likened to that of the smith and his fire, without whose work the iron and coal would avail

nothing; while the easily superadded idea of sequential development (which it is now sought to impress) may be likened to that of the progressive shaping of the horseshoe under successive blows, without which the heat and the sweat would avail nothing. It should be self-evident that motion involves progression, that there can be no dynamic action without sequence; if this be clear, the tracing of human progress is easy; if it be not clear, words are idle so far as the defining of human progress is concerned.

Recurring to the image of the breeze-rippled river, the volume of human experience of mankind may be likened to the lake-like body lying apparently inert save as troubled by the passing breeze of superficial opinion; or it may be likened to the real river whose current is quickly detected by the worker who stems or sounds the stream beneath the wavelets, and who must sooner or later learn which way the current sets—whether it runs down toward St Louis or up toward St Paul. Returning from the simile to the fact, it is easy—indeed but the normal and spontaneous action of the mind—to trace the trend of human development in terms of the human activities as now defined. True, the survey cannot be followed (save with the eye of faith) by those standing below the plane of dynamic interpretation—for none can justly judge the direction of movement save those who realize the fact that movement exists; but the fact that it is made from this new-gained eminence in the realm of science gives the survey a degree of accuracy not hitherto obtainable.

Let the survey of the course of human development be essayed in terms of the activital classification recently adopted in our law.

Somatology

The development of the somatikos, especially the osseous framework, was summarized by a master in the last presidential address before this Society.¹ This summary and other ethnic

¹ "Primitive Man," by Frank Baker; *American Anthropologist*, vol. XI, 1898, pp. 357-366.

records show that the human cranium has increased in capacity and changed in form from that of *Pithecanthropus erectus* to that of enlightened man; that the arms and hands have shortened and acquired greatly increased amplitude of movement; that the jaws have condensed from prognathic type to the human form; that the pelvis and leg bones have become better adapted to the erect attitude, while the opposable toe has lost its function—though even the most advanced skeletons retain vestiges of primitive character. Summarily, these changes represent a process of *cephalisation*, discussed long ago by Dana as manifested chiefly by lower organisms, and more recently by Marsh as manifested chiefly by the higher vertebrates; but the student of human structure can go further and find easier way than the zoölogist, since the cephalization of mankind is incomparably more pronounced than that of the subhuman organisms. The average capacity of recent European crania is much above the average among the cave men of Europe; the skulls of modern dissecting rooms are decidedly better developed than those of ancient ossuaries; the crania of the Incas found by Pizarro appear to be persistently larger than those of the pre-Incan Peruvians; even in the history of America, to judge from the best portraits extant, the cranial conformation has changed from the retreating type of Washington and his contemporaries to the full-forehead type of the living statesman. The data are less complete than might be desired; but wheresoever there are measurements for comparison their testimony is consistent—they tell of progressive increase in cranial capacity among all peoples, with decrease among none. And the records show that cranial capacity is correlated with culture-grade so closely that the relative status of the peoples and nations of the earth may be stated as justly in terms of brain-size as in any other way—for while brain-structure would doubtless afford better criteria, the data are lacking. The most conspicuous fact of somatic development is cranial growth; yet the process of cephalization is manifested hardly less strikingly in the reduction

of prognathism, in the shortening of the fore-limbs, in the tendency toward diminution in number of teeth which dentists note, and in other characters of both skeleton and soft tissues.

Correlated with cephalization is a somewhat antithetic process, found only among mankind, which may be called *cheirisation*. It is the process involved in manual training, both subconscious and purposive; its mechanism appears in the wide range of action in the human hand as compared with the paw of the animal, and no less strikingly in the increasing range in manual capacity found in ascending the scale of human development from savagery to enlightenment; its effects are displayed in the better development of the forearm among white men than among yellow or black men; and its prevalence is shown in the hundred manifestations of manual dexterity among cultivated men to each half-dozen found among primitive men. Yet the process is not limited to the hand; it is expressed also in that mobility of countenance and modulation of voice and eloquence of eye that distinguish the civilian from the savage stoic (so called because his poor heritage does not embrace that refinement of bodily function enjoyed by the higher of his kind); it is expressed incidentally in robustitude of limbs and sensitiveness of skin to touch and temperature—for it is the reciprocal of concentration, and stands for peripheral development in its various aspects. It is expressed more emphatically than in any other way in the motions to which all human activities are reducible, especially in the centrifugal (or outward) motions normal to higher culture in contrast with the centripetal (or inward) movements normal to primitive men. The yellow or red or black artisan draws his cutting tool toward his body, the white artisan pushes knife and saw and plane outward; the primitive weapon is hooked, the more advanced weapon curved outward, and the javelin and boomerang and bow mark great advance along the way toward the aimed projectile; the lower fighter clinches, the higher pugilist strikes and parries; the less cultured scribe writes from the

right, the more cultured toward the right; the plodding coolie plants his feet in the line of his path, the high-bred mandarin turns his toes outward at right angles to his front; the clumsy cook wipes the dish toward her and often drops the crockery, the deft dishwasher wipes outward and can be trusted with costly china; the self-centered subject swills his soup from bowl tipped toward him, the out-seeing sovereign and citizen instinctively tip the soup-plate outward—in short the way of progress is from the egocentric to the open and free in manual motion as in cerebral action. It is true that few of the data of cheirization are in the books; but they overflow the poor work-sites of savage skin-dressers and ancient arrow-makers, the simple laboratories of barbaric stone-workers and semi-barbaric smiths, the mines and mills of civilization, and the elaborate manufactories of enlightenment—they are far too voluminous for books, yet within constant sight of all whose eyes are open.

While cephalization and cheirization stand out among the factors of somatic development, they are little more than charts to that highroad of human progress which lies in *coordination*—the conjuncture of hand and brain, or more exactly of the initiative and directive faculties. Expressed summarily, the somatikos includes the osseous framework, the alimentary and respiratory and circulatory systems by which internal relations are maintained, the muscular system by which external relations are developed and extended, and the dermal system by which the structure is protected; and over against these the neural system, culminating in the brain, by which both internal and external relations are regulated. Now, somatic progress might be measured, were the means of measurement available, by the advance in neural structure and function found invariably in passing from infancy to maturity, from the lower races to the higher, from the earlier culture-grades to the later, and in each race and grade from the human flotsam to the leaders of their kind; with this advance the capacity for pleasure and pain grows acute from the

dull savage to the vivacious civilian, yet the aggregate of pleasure always exceeds the total of pain, so that smiles and laughter and music and poesy grow up while the dark faith of Moloch yields to optimistic light—save in the sporadic Jeremiah whose bodily generations have apparently outrun the cerebral growth of his stock.

Somatic coördination is expressed in that combination of neural and manual capacities sometimes called *faculty*. It is matter of common observation that the white man can *do* more and better than the yellow, the yellow man more and better than the red or black; and the record of handiwork found in the archeology of the world tells that faculty has grown steadily from age to age, while the written records of industrial history prove increasingly rapid development of faculty from generation to generation among the peoples of the world. A part of the improvement may indeed be ascribed to augmented knowledge (itself the highest expression of coördination), yet only a part can be so explained; for those who know the races realize that the average white man is stronger of limb, fleetier of foot, clearer of eye, and far more enduring of body under stress of labor and hardship than the average yellow or red or black—despite the special proficiency along a few narrow lines sometimes displayed by the lower type and drawn large in travelers' tales. So, too, those who trace the generations through history realize that the later are stronger than the earlier; Rollin perpetuates the staggering records of Milo the Champion and other marvels of the classic arena, yet the witnessed feats of Milo are outdone by living Sandow, while American athletes defeat the descendants of gladiators on their own ground; the average Briton or American is too big for the armor of the mail-clad hero of medieval history; the rough-riding scion of enlightenment appals by his superior stature the puny soldiery of unprogressive monarchism; it is a poor modern year that does not mark the breaking of one or more world-records in athletics; and the citizen artisan habitually

keeps up with a machine geared so high that the subject workman loses one stroke in six.

Another expression of coördination is found in that progressive vigor and viability vaguely connoted by the term *constitution*. The practitioner among different races knows that while the primitive man may suffer less than his civilized brother from a slight wound or illness, he possesses little recuperative power and dies of injuries or disorders from which the Caucasian would easily recover; comparison of the longevity tables of Pompeii, of Europe early in the century, and of modern actuaries, shows a progressive increase of nearly a decade in the average expectation of life; and the same story is told in more commonplace yet infinitely more emphatic terms by the steady increase in population of the world, an increase wrought chiefly by the two higher races and the two higher culture-grades—especially the Caucasian race, and (during recent decades) the budded enlightenment of Britain and full-blown enlightenment of America.

In brief, the witnesses of somatic development from race to race, from antiquity to modernity, and from generation to generation are many and in the main consistent; the skull has risen from the simian type, the skeleton has become more upright and better adjusted to brain-led activities, the muscles have gained and are still gaining in efficiency if not in absolute strength, the faculty for work (or normal exercise of function) is multiplied, the constitution is improved in vigor, life has grown longer and easier, and perfected man is overspreading the world. There are indeed isolated experiences suggesting human degradation, and these are flaunted by those prophets of evil whose lamentations are always loudest and longest continued; but when all available experiences and records of experience are brought together fairly, only a single general trend can be traced—the trend toward better physique and greater strength. The forecast for the future based on the sum of human experience is bright; for the current of human progress wells upward as the river flows down

toward the sea, and none can look forward and downward without forgetting the current of experience behind.

Biology and anthropology touch in the somatikos, which is held by both to be the product of organic development during eons past; yet one of the most patent facts of the organic world is the broad gap between man and the lower animals. True, the human skeleton so closely conforms to that of the apes that, according to Gill and others, no link was lacking even before the finding of *Pithecanthropus*; true, most of the muscles and tendons of man and the higher apes are homologous, while man retains vestigial structures manifestly inherited from simian ancestors; yet the great fact remains that even the lowest savage known to experience is human in attitude, mien, habits, and intelligence, while even the highest apes are but bristly beasts. It were bootless to deny or decry the chasm separating the always human biped from the always bestial quadruped, since the chasm is the broadest in the whole domain of nature as seen by those who appreciate humanity in its fulness—it were better to face the chasm fairly and seek to bridge it squarely.

In attempting to define what may be called the *humanization* of the bimane, it is necessary to again question whether the extension of essentially biotic laws into anthropology has not been overdone. One of these is the law of the survival of the fittest, which indeed holds (within limits) for human activities and products, yet seems not to hold for man himself, who strives to reform rather than exterminate the weakly and the wicked; another is the biotic law of sexual selection, which can hardly hold in an assemblage of organisms all normally mating and leaving progeny, practically regardless of personal beauty or habit of mind—indeed it would appear that, in those communities in which the predominance of either sex renders a test possible, the most attractive individuals of the predominant sex are, on the average, the last mated and the least prolific. The apparent fail-

ure of these laws of lower life has led to the inquiry, by Powell and others, whether they are not annulled by higher laws pertaining to the genus *Homo* in his demotic attributes. The inquiry is made pertinent when certain human characters which manifestly reflect demotic functions are noted—e. g., the organs of speech, which are highly differentiated among the better races and in the more advanced culture-grades, much cruder in the lower races and in primitive culture, and but rudimentary in sub-human animals. The inquirer soon finds a clue in the specific modification of hands, fingers, arms, and other organs connected with special occupations, particularly when hereditary, for the numberless facts of such experience show that the *somatikos* is susceptible of reshapement through exercise—and the suggestion has been actually applied by intelligent leaders of gymnasia who habitually reshape the bodies of their pupils to their liking by carefully devised courses of exercise. These and other experiences seem to show that *the reconstructive forces in effect since man became human are the demotic activities, and that the efficiency of these forces in the reconstruction of the somatikos is proportional to the intensity of the activity at the time of action.* The blacksmith develops muscle and bone, not in sleep or noontday idleness, not even in waiting by the forge for the iron to heat, but in the actual exercise of forging, and, in some obscure way, the frequent alternation between vigorous effort and complete rest harmonizes with the rhythm of the organism and renders the exercise peculiarly constructive; so, too, the soldier coördinates body and mind and attains his peculiar powers, not by resting or reading tactics, but by supreme action, the action first of simulated and then of real strife. It is the lesson of experience—even though quantitative data are lacking—that the efficiency of the human activities increases in more than an arithmetic ratio with the intensity of the action: the poem written in an hour may consume the stored-up energy of a month, the noble painting is the product of inspiration, the great invention is the

creature of a psychologic moment, while the career of a lifetime is shaped by a few critical hours or days; and it seems equally certain, once attention is directed to the subject, that the course of demotic modification of the human organism is to be traced in the succession of critical instants of supreme intensity in action and passion. The canyon-cutting river ripples idly over its bed without carving a line during the eleven months of low water, and then saws through a foot of rock during the month of freshet; and so the stream of human activity ripples merrily but idly until crises compel the action by which the mind is molded and the body shaped—when conation becomes the key-note of progress, as our associate Ward has shown.

With due appreciation of the paramount role of concentrated intensity of action in shaping the course of human development, it seems possible to explain, at least provisionally, the apparently sudden and complete transformation of man as he left the plane of the brute, and his continued and increasingly rapid development on the higher plane. The differences between man and ape which appeal to all observers (save those whose trained vision is fixed on structural homologies alone) are too many for easy reckoning; they include the erect attitude, the practically hairless skin save where a more luxuriant pilary coat serves esthetic function, the expressive countenance susceptible alike of smiles and tears, the tool-using hand, and above all else the peculiar intelligence enlivening the visage and directing the hand—attributes which indeed find their germ among lower animals, yet attain full development only in the highest of the series. For convenience, these and other attributes may be combined in somewhat general categories, (1) the erect attitude, (2) personal comeliness, (3) manual delicacy, and (4) capacity for intellectual choice of associates and mates.

Now, the distinctive characters of *Pithecanthropus*, erect yet almost simian in size and form of skull (and so marking a critical stage in development), support a previous view that the upright

attitude must have been the earliest of the specifically human attributes in order of development, since it is essentially biotic while the others seem to be demotic and traceable to its influence. Accordingly the progenitors of human kind must have associated face to face and hand to hand, and developed—howsoever unconsciously and crudely—ideals of comeliness based on stature and facial feature and gesture; and, for the first time in the history of the world, the supremely intense effort of vitality to perpetuate its own stream was marked by full sight of the transfigured face of the mate, with eye speaking to eye and voice to voice in eloquent expression of intellectual choice. Such may well have been the real beginning of humanization; and from the beginning it has seldom been the average beings who have begotten progeny, but the momentarily inspired—yea, glorified—pair whose excellences of manhood and womanhood are caught in mutual apotheosis to be carried up the stream of life and made better with each succeeding generation. If the ideals of a physiologic moment be perpetuated, as Moses taught, and as most primitive tribes believe, then Goethe dreamed wiser than he knew of the elective affinities, and the modern student may bridge the broad break between beast and man—may explain the quick-grown comeliness of his kind even unto the elimination of bestial bristles and dermal pigments, may understand the exaltation of love, the rise and ramifications of romance through song and story, and the development of the strongest collective ties; yet, whether he adopt the interpretation or not, he cannot gainsay the great facts of human progress conjoined by the hypothesis.

A conspicuous though much neglected fact in the somatic development of mankind is hybridization, or rather *consanguinization*, whereby tribal and racial boundaries are constantly broken down. Among most primitive peoples intertribal mating is regulated by surprisingly comprehensive laws, which commonly prohibit intermarriage within certain groups and without certain

larger groups—though few neighboring tribes are so inimical as to prevent occasional intermarriage, perhaps through war or enslavement; so that there is a constant and, on the whole, fairly rapid intermingling of blood among the savages and barbarians of every continent or larger province. Among advanced nations, especially in that enlightenment in which individual action is largely freed of conventional barriers, international and even interracial mating is still more common. So it is not too much to say that the streams of the blood of the world are converging, if not uniting—a fact that must be accepted as a condition, howsoever repellent as a theory.

It is not easy to measure the consequences of the blending of blood, since the testimony is hardly consistent; on the whole, it would seem that intertribal and international blending is beneficial physically as well as socially, but that interracial union is often apparently injurious, generally of doubtful effect, only rarely of unquestionable benefit. It is a great fact, recorded in the entire literature of history, that the predominant peoples of the world are of mixed blood, and that generally the degree of predominance seems to be measured by the extent of the intermixture; nor can it be forgotten that the blending of the white and the red has produced some of the finest specimens of humanity the world has seen, including one of the world's foremost leaders, the President of our neighboring republic; or that the mixture of white and black has produced a Frederick Douglass, a Booker T. Washington, a Blanche K. Bruce, a Paul Laurence Dunbar, and other makers of progress in the most progressive nation. By far the greater part of the interracial matings have been illicit, and between the lower specimens of one or both lines of blood, so that the evil of miscegenation may well have been intensified; and this fact enhances the interest of dispassionate students in the results of legal matings, and especially in those of the eminent Othellos and dignified Desdemonas domiciled in our national capital and scattered throughout the country.

The sum of experience concerning the blending of human blood is easily stated. No tribes, or races, or nations are drifting apart in blood, none have drifted apart (if such a process be possible) during any period recorded in history, while all are now either running parallel or converging and uniting—in other words, the blood distinction of the world is steadily diminishing, and is less today than ever before since the beginning of history or interpretable prehistoric record.

The prominent facts of cranial size and structure revealed in the pithecanthropoid and higher types, and the hardly less conspicuous fact of reshaping of hands and other organs through exercise in the essentially human activities, shed some light on the features and functions of the human prototype, and so on the earliest steps of human progress, the testimony of *Pithecanthropus* being peculiarly significant. Viewed collectively, the great facts seem to indicate that the transformation began with the assumption of the erect attitude, and advanced with cumulative rapidity as the processes of cephalization and cheirization went forward. Now, the erect attitude itself suggests maturing differentiation between the locomotor and prehensile organs, coupled with definite concentration of function in the two pairs of differentiated limbs; while the skull-molding and hand-shaping activities necessarily attending the erect attitude betoken a degree of anterior development hardly consistent with the retention of diverse posterior organs for locomotion and prehension combined (indeed the human body is characterized by relative smallness of the lumbar ganglionic complex, scarcely less than by relative largeness of the brain-case); so that the several lines of structural facts seem to point to a tailless ancestry, not merely at the critical stage but throughout eons of antecedent progress. These phylogenetic indications emphasize the obvious outward differences between existing quadrumanes and men, and at the same time explain the absence of living links between the simian or

pithecoïd and the human types; for they warrant the inference that the lines of ascent diverged somewhere below the plane represented by the modern simian. If this inference be correct, it would follow that the representatives of the human line must have either fallen in the transitional struggle or risen well into the ennobled type in long-past ages, not yet noted in the chronology of any continent or clearly fixed in the scale of paleontology. The inference and its corollary are in line with the conspicuous facts of both human and animal realms; for the law of humanity is convergence in blood and brain to a degree overshadowing environment, and the law of animality is divergence into varieties and species and genera adapted to environment, while no trustworthy observation suggests that even the highest apes can blend with even the lowest savages—they may be domesticated and indeed artificialized in some measure (though less completely than horse and dog, so far as the records go), yet there is no real interchange of culture—much less of blood—such as characterizes the human realm.

The testimony of function-shaped structures concerning the infancy of the race is extended by that of various vestigial functions and structures; these are especially conspicuous in tree-climbing tribes, yet hardly less notable in early infancy among advanced peoples. According to Hilder, the Tagbanua tribesman of the Philippines is almost quadrumanous; the hallux is nearly as completely opposable as the pollex, a knife or pin is readily picked up with the foot, while, in climbing, branches are grasped with the toes so firmly as to support the weight of the body; the average Caucasian infant shares character with the Tagbanua and the bestial quadrumane to the extent of measurably opposable hallux and prehensile feet; and when the hereditary pedal power is perpetuated by exercise, as in Unthan, the armless German (who is a fine marksman and fair penman despite his infirmity, and who uses knife and fork, or cigar and match, or comb and brush, with no less dexterity and delicacy than other

well-bred men), the feet retain their vestigial deftness throughout life. Coupled with these limb functions are certain special structures, like the *scansorius* muscles of the quadrumanes which commonly persist in form if not in function among bimanues; and special functions of normally functionless structures, like the auricular muscles which retain the useless power of moving the ears in many infants and occasional adults, as described by Darwin. Especially significant is the ability of the new-born babe to suspend itself by hands and arms for considerable periods; for this marvelous persistence of a function weakened by desuetude during a thousand generations unquestionably tells of adjustment to an aberrant (not to say unnatural) environmental condition by survival throughout a vast period. These and other vestigial indications are parallel in direction; the pedal power of infantile men and races points to a tree-climbing ancestry; the voluntary mobility and delicacy of the ears point to a woodland habitat in which these organs were the chief detectors of danger, the subtlest bond between the individual and the great external, as among certain arboreal monkeys of South America and other provinces; while the hereditary prehensile faculty of infancy seems to demonstrate a strictly arboreal habit pursued from the instant of birth to the end of life.

The evidence of somatic structures and the indications of vestigial features are still further extended by the testimony of nascent activities shared by the higher quadrumanes and men: The gorilla wields a club and the baboon carries a cane, while the Liberian monkeys, according to Cook, use sticks and stones as implements and weapons combined; similarly the presumably autochthonous Seri Indians use pieces of wood and stone picked up at random, as well as shells, fish-spines, cactus thorns, teeth and bones of animals, and the silicious epidermis of the cane, in their simple industries, the objects of more obdurate material remaining unwrought save as shaped in use; while the simplest artifacts known to archeology consist largely of tooth, bone, shell,

and other substances suggesting riparian or maritime habitat. In somewhat more advanced culture, as shown by Cushing, wood and clay were shaped in similitude of these natural objects under a persistent system of symbolism, at once recording an early shoreland influence and explaining the strong tendency of primitive peoples to deify seas and streams and perpetuate other notions implanted by the waterside. The evidence of budding demotic function, especially in America and eastern Asia, is in line with the obvious fact that shores abounding in sea-food afford the simplest and easiest livelihood for humans of the lowest culture, and that they are the natural lines of migration under the pressure of the food-quest, as shown by Mason; while it is the commonplace experience of both primitive and cultured huntsmen that the stream-diversified woodland—yielding fish, flesh, fowl, and fruit, constituting an easily-memorized natural map, and affording natural ways of travel—is the environment best adapted to life when the appliances of higher culture fail. The leading facts of initial activities, of the localities of easiest livelihood, and of the lines of easiest travel are in harmony; they indicate that the earliest men were not only arboreal in habit but orarian in habitat.

So it would appear that while the body of recorded experience relating to primitive man is too limited to warrant final judgment concerning the origin and early development of the human genus, it is sufficient to suggest that the prototype was a tailless quadruped inhabiting coastwise or river-watered forests. True, there are some indications that in certain provinces man became troglodyte or mountaineer while yet in primal state; but there are still stronger indications that, whether the cave-dwellers were autochthonous or not, most modern men must be regarded as wanderers from the natural Eden of a wooded shoreland.

Summarily, the trend of somatic progress is clear, despite the mists beclouding the earliest stages: No experience tells of

structural or functional differentiation save such as reflects brain-led activities, themselves coalescing with the confluence of culture; all experience tells of slight but steady remolding of the body through exercise and inspiration's spur, of steadily improving coördination of hand and brain, of the elimination of race distinctions through blood-blending. When the entire field of man's experience of physical man is surveyed, it becomes clear that the human genus is not dividing into species, as the bestial genus divides, but is steadily drifting toward unity of blood and equality of culture. It seems safe to project the lines of experience of somatic progress a little way into the future and a longer way into the past; projected futureward, they converge in consanguineal union transcending tribal and racial distinctions; projected backward, they divaricate to an indefinite number of confluent currents coming up from proto-human sources to successively merge in the great stream of living humanity—a stream traceable by all who pause to note commonplace facts of everyday observation.

Psychology

It is postulated in this writing that, as taught by Darwin, organisms are molded by interaction between their own bodies and their environment, and that the effect of the interaction is perpetuated and made more definite from generation to generation; it is postulated also that, as taught by Spencer, organized bodies are composed of highly differentiated terrestrial substances combined in such manner as to perpetuate themselves through the continued maintenance of internal and external relations; it is postulated further that the organization of living bodies is hierarchic, the organs of most highly differentiated substance dominating the organs of less differentiated substance, and the degree of differentiation and domination increasing from simple tissue to nerves and ganglia and culminating in the brain; it is still further postulated that, as recognized for a half-century, the brain is the organ of the mind, and that its function is the conservation and

creation of intelligence; it is finally postulated that, as taught by Bacon and reaffirmed by Powell, the mind is a reflex of nature, more or less perfect according to the directness or indirectness of its contact with nature.¹ From these postulates and from the observed facts of somatic development, it is inferred that the human brain, and so the human mind, are capable of progressive development through appropriate exercise; and from the postulates and the observed facts of demotic (or activital) development, it is inferred that the human mind is capable of progressively increasing its own control over the human body-substance, and of progressively extending conquest over other materials and powers of nature through the media of muscles and machines. Whether the postulates and inferences be accepted or not, the great facts of psychic development throughout the world cannot be gainsaid; yet acceptance would make easier the understanding of psychic progress.

The most conspicuous fact of psychic development—one noted subconsciously or consciously by every intelligent being—is found in the normal persistence and augmentation of knowledge. Units of substance may be conveyed or exchanged, but when once transferred they are gone; units of power may be transferred, but always appear to be lost on the one hand as they are gained on the other; while units of knowledge may be transferred indefinitely from party to party, yet no party loses though all may gain. This great fact may seem trite; certainly it is the commonest of commonplaces in human experiences; yet, on serious thought, it must be regarded either as a meaningless paradox or as a peculiarly meaningful expression of law. Some of the attendant conditions are worthy of note. It has been known for centuries that the teacher may convey given knowledge, with more or less loss according to his skill or lack of skill, to each of five or fifty or five hundred pupils without surrendering an iota

¹ Compare "The Foundation of Science"; *The Forum*, vol. XXVII, 1899, pp. 168-178.

of his original stock, and indeed with some gain to himself; it was long ago observed, too, that in time the scholastic teacher becomes stale, loses mental elasticity, and must be superannuated or discarded; while much recent experience indicates that the teacher of nature finds his theme an inexhaustible well-spring of knowledge and continues to acquire and impart the facts of nature with little loss of efficiency, and indeed with certain gain, until senility settles on the faculties of body and brain at once. These and many other experiences verify the marvelous prevision of Bacon, and go far toward proving that the mind, with its wealth of inherited and acquired knowledge, is but the product of interaction between its own hierarchy of organs and the great external; at the same time they remove an apparent obstacle in the way of considering mental power as indefinitely extensible with the progressive growth of its own proper organ and the ancillary organs of the human body. Accordingly it would seem timely and profitable to recognize a law of mind, comparable with certain other fundamental laws which have been incorporated into the body of science; one of these is the law of indestructibility of matter; another is the law of conservation of energy, or "persistence of motion" if the latest formula be adopted; that which is now enounced is the *law of cumulation of mind*. The summation of experience expressed in this formula of mentality is comprehensive; under postulates which seem axiomatic, it is in accord with the prehistoric development of protohuman and human crania, with the beautification of the human body, with the reconstruction of the primitive somatikos by demotic interaction, and with cephalization and cheirization in their multifarious aspects, as well as with the purely intellectual development of mankind. The reduction of the formula to quantitative terms is a task for the future.

The current of human experience with respect to the progress of the human mind is strong and unmistakable; mental power is increasing with the multiplication of interactions, and, like the

strength of ancient Anteus, is constantly renewed by contact with nature; the knowledge in which the power is stored up is never lost save in the extinction of entire groups or in the death of the recluse, the robber of his kind, but is only brightened and purified and multiplied by exchange and carried forward by the generations of men with cumulative rapidity; and as the generations arise and mingle and pass away, this noblest of heritages increases and spreads from tribe to tribe, from nation to nation, and from continent to continent, ever unifying mankind, ever dominating lower nature.

The postulates concerning the organs and functions of mind seem to elucidate a much mooted problem in ethnology: Many investigators have been impressed by the similarity in mental operations displayed by unrelated peoples, perhaps inhabiting separate continents, and have been led thereby to infer that the peoples were of common ancestry; Israelite and Indian, Egyptian and Yucatecan, Polynesian and Peruvian, Malayan and Mexican, have more than once been combined on the supposed evidence offered by similarities in activital products or in the activities themselves; world-wide symbols like the swastika have been held to establish the genetic unity of the human genus; and through subconscious ratiocination nearly all thinkers have integrated their experiences, howsoever limited, into an intuitive hypothesis that all men sprang from a single pair. During two decades expert anthropologists have been engaged in rectifying the real and assumed data for this hypothesis; Powell began by explaining the origin of activital similarities (or activital coincidences); Brinton and others have insisted that any two minds must be expected to respond similarly to similar stimuli; British anthropologists half deride and half accept this teaching as the "American Monroe doctrine of anthropology"; while different students have tacitly or openly accepted the view that minds, wheresoever placed, must develop along essentially parallel or converging

lines. By some, the uniformity of mental action has been deemed mystical or extranatural, just as every striking manifestation of nature is deemed mystical in pre-scientific culture; yet the mystical view would seem unnecessary and no less misleading in this case than in others.

In brief, just as the organic body must (under the primary postulates already outlined) be regarded as an assemblage of substances and powers reflecting the interactions of ancestral organic existence, so (under the same postulates) the mind organ can be regarded only as an assemblage of substances and powers epitomizing all ancestral interactions between itself and the rest of the somatikos, and between the somatikos and the great external. It follows that, just as any two organisms of the same species are like in physiologic process and in response to external stimuli, so any two brains of equal faculty must function alike or so nearly alike as the environments by which their final shaping was given. Accordingly, the much-mooted unity of the human mind would appear to be nothing more than a manifestation of cerebral homology (itself the record of eons of organic development) perfected during the final eon of demotic progress.

It is significant that the more striking activital coincidences (such as the independent development of corresponding calendar systems on opposite hemispheres) exemplify like response to like stimuli by minds approximately equal in culture status; the well observed cases by no means exemplify like response to unlike stimuli, as might be anticipated if mental faculty were either (1) extranatural in origin or (2) derived from a single original source; so that, on the whole, the recorded examples of uniformity in intellectual action seem to point toward a natural and spontaneous development of mental faculty in full accord with environing conditions—a course of development caught by Bacon, albeit in narrower range, three centuries ago.

While so conspicuous as to challenge attention (in accordance

with the law under which observation begins with the unusual), the activital coincidences among diverse peoples are much less common and persistent than those differences in mode of thinking which form the strongest bar against union of tribes and nations. It is a commonplace of observation that aliens can intermarry more easily than live together in harmony (save where one is able to extinguish the discord by overpowering tone); it is a commonplace of history that nations war ten times over differences in faith, or faith-inspired conduct, to each battle over realities; and when tribes, either in natural condition or grouped on reservations, engage in strife, the source is almost invariably traceable to diversities of belief or language or law, that is, to mode of thinking. So, too, the most serious obstacles encountered by ethnologic students and missionaries are fundamental differences in the way of viewing things which hold them apart from their alien co-laborers; and when the lower thinker adopts a higher faith, it is long a lightly-worn veil, to be cast aside in times of stress, before the new woof is fully woven into his web of thought through fixed habit or heritage. By superficial observers these persistent diversities in mental operation are sometimes ascribed to difference in race; but deeper study indicates that they reflect habitual activities, and are thus demotic rather than biotic, the expression of brain rather than blood, the mark of culture rather than color.

Incongruities in mode of thinking form a social factor of no small moment among higher as well as lower peoples: The European statesman constantly stands guard against misunderstandings growing out of local habits of thought and colloquial forms of speech; even the American nation has more than once met threat of disruption merely because citizens of different sections failed to understand each other's motives; and the chief obstacles to international alliances grow out of provincial prejudices, which are only slowly—albeit steadily—disappearing with the unification of knowledge by means of travel, telegraphy, tele-

phony, and the immeasurable influence of ephemeral press and more permanent literature. The diversity in intellectual action among different peoples is well displayed in that most spontaneous form of thought, humor. Probably no race is able to appreciate the humor of any other race; but it is equally true that no people readily assimilates the humor of another people, whether of the same race or not: The Englishman chuckles at *Punch* and glowers at *Life*, while the American groans over the former journal and grows hilarious over the latter; even the Scot chaffed by the Englishman over the need for hammer and chisel to get a joke into his head retorts aptly, "No doubt you are referring to an English joke." Indeed, when any two peoples can freely exchange quips and jests and *jeux d'esprit* they are ready to adopt the same body of law, whatever their differences in material interests or in hue or skin. The philosopher (whose name is legion), caring not who writes the laws for a people so long as he writes their songs, grasps a great fact in human nature; for deliberate thought is always more closely attuned than the spontaneous upbubbling of lighter vein. And one of the significant signs of the times is the increase and diffusion of light literature serving to obliterate sectionalism and bind ever-widening circles of thinkers with cement of sympathy.

On analyzing the incongruities in mode of thinking displayed by diverse peoples, it would appear that some (especially those of more superficial character) are traceable to environment; for, other things equal, the mental operations of peoples vary with their surroundings. At the same time it would appear that a greater part of the incongruities (especially those of more fundamental character) are traceable to culture status; for, other things equal, peoples rise above environment in a degree proportionate to the quantity and kind of their knowledge—when their modes of thinking tend to become uniform under the general law of activital coincidence. Accordingly, thinking might be classified in terms of environment; but it may be much more compre-

hensively and usefully seriated in terms of culture-grade. Now, the principal stages in cultural development have already been defined as (1) *prescriptorial* and (2) *scriptorial*; these stages corresponding approximately with stages in social development commonly defined as (1) tribal and (2) national. More extended comparison indicates that both culture-stages may advantageously be subdivided; and the entire series may be outlined as follows:

1. The earliest culture-stage defined by mode of thinking is necessarily obscure, since primeval man no longer exists, and since his characteristics survive only in vestigial form, chiefly in linguistic and esthetic symbols and in minor features of mythology. According to Hewitt and others, the linguistic vestiges indicate that primeval man used a distinctively pronominal speech, supplemented by pantomime; according to Cushing, the esthetic vestiges suggest that primeval thinkers were dominated by ideas of personality, such as were recognized by Humboldt, Brinton, and others; moreover, there are many indications that early men were given to personifying and even deifying a vast range of impersonal entities, so that the most primitive mythology is burdened with a mass of reified and deified entities which it is the function of later culture to eliminate or concentrate. The several lines of evidence indicate that the primeval thinker was controlled and habitually appalled (like the shy and timorous beasts passing into intelligence through the hard way of cunning) by half-realized entities, that his world was one of abounding objects often idealized into intensified objectivity, and that he thought largely in terms of the abounding things designated by his pronouns and natural gestures. This stage in thought may provisionally be called *pronominal*.

2. The next developmental stage is well illustrated by various primitive peoples now living, e. g., the American natives. In this stage objectivity yields gradually to relativity, and the modes of thought and expression are essentially associative; the language is holophrastic and connotive; the esthetic motives are symbolic,

with a strong tendency toward conventionality; the mythology embraces a hierarchic pantheon in which the deities and their bestial or human vicars hold definite place, sometimes fixed by a cult of the Quarters; the social organization is maintained by reckoning from the ego, and often memorized by placement of individuals in the family and of families in the tribe. The prevailing habit of thought is egocentric, in that the cosmos is classified with respect to the ego (which is so amplified as to involve elements not only of person but of place, of time, and of action); but, since the dominant idea is that of relation between self and other entities, it may better be characterized as *associative*.

These two stages combine to form the general stage of prescriptorial culture, in which thought is shaped and conveyed chiefly by oral symbols, with some aid from gesture and graphic symbolism, and is measurably crystallized and perpetuated by means of tradition. The shadowy pronominal method seems to pass naturally into the associative mode of thinking, which persists in turn until the volume of knowledge becomes so great as to overload the increasingly complex system, when an arrangement better adapted to a larger body of knowledge arises spontaneously.

3. In the third stage the hand supplements the tongue, and the oral symbols are duplicated in manual symbols in such fashion that writing and other graphic devices replace tradition and relieve memory of its greatest burden; at the same time the objective terminology, at first pronominal and then connotive, gradually becomes denotive, while pantomimic and other actional devices are replaced by verbs and cognate oral and graphic action-symbols; at the same time, too, associative inflectional forms drop into desuetude, while the simplification of language is doubly accelerated through the addition of hand-economy to tongue-economy. The advance in speech, albeit notable, would seem but to reflect a stimulated cheirization and an improved coördination marking growth in self-consciousness of power and in effort to subjugate nature; the key-note of the stage is action

—the verb in language, outward movement of limbs, vigorous extension of thought. With the coördination of hand and tongue, perfected by exercise in graphic construction, cheirization is stimulated, and limb and brain come into closer coöperation to the further strengthening of both organs; and, with the stimulation of the sense organs brought into play through the coöperation, impersonal relations are perceived, analyzed, and gradually systematized. As the perception of relation proceeds, the lowly egocentric system becomes ethnocentric and then democentric, while among the more learned a geocentric cosmology arises and gives place slowly to a heliocentric system; at the same time perspective appears in art, and a refined spirituality in faith. As the perception of relation extends to individuals and their activity products, the concept of property-right crystallizes; then the relation between individuals and their habitat is perceived, and the concept of territorial right arises to mature in a new order of thinking. In its most general aspect, the thinking of this stage may be defined as *coördinative*.

4. As manual activity bears fruit in mechanical devices a fourth stage of thinking, in which thought-symbols are multiplied and perpetuated by mechanical devices, grows definite. Machines replace unaided hands, printing replaces writing, and semi-symbolic conventionism declines in art as mechanically faithful portraiture betrays its weakness; and in every stage the mode of expression reacts on the way of thinking. As the habit of action grows, and as the relations of things in nature are perceived with increasing clearness, inherent forces are controlled with ever-growing success; the brain prompts and the hand responds, and each full response gives birth to new impulses; and, as faculty develops through exercise, the passive coördination of perceiving relation rises into the active coördination of regulating relation. The modes of thinking in this stage are multifarious and complex, and perhaps too near at hand for just definition; but they may be characterized provisionally as *inventive*.

The coördinative and inventive modes of thinking give character to scriptorial culture; yet there would seem to be a measurably distinct stage now arising in the highest culture—a stage in which knowledge is instantaneously diffused over the earth by the telegraph, in which the human voice sounds over the continents through the telephone, and in which various devices for the annihilation of space and time are reacting on thought in such manner as to unify the thinking of all humanity. It is becoming evident, too, that the coördination of thought by means of devices whereby brain is brought in contact with brain throughout the world (as suggested by intercontinental telegraphic chess games) produces a constructive coöperation between widely separated thinkers, somewhat akin to that of individual hand and brain, and thus shapes a collective and superorganic mechanism for the making of knowledge by the conjoined efforts of many workers. This immature stage seems to be essentially *creative*.

In brief, the culture-stages may be outlined as (*A*) prescriptorial or receptive, comprising (1) pronominal and (2) associative thinking; (*B*) scriptorial or directive, comprising (3) coördinative, and (4) inventive thought; and perhaps (*C*) superscriptorial or (5) creative mind-work; and it would appear that no thinker in any stage or sub-stage can comprehend the thinking of any higher plane, or fully assimilate that of any lower plane. These principal stages and sub-stages are themselves made up of local and temporary phases of thinking too many for enumeration—indeed as many as there are distinct peoples; yet all these appear to fall naturally into groups corresponding to the stages outlined.

When the culture-grades, or planes in cultural development, are thus defined, it becomes easy to understand the various ways in which different minds respond to given stimuli, and, at the same time, to weigh such activital coincidences as occasionally arise; it also becomes easy to discriminate the effects of the external and internal factors of thought, that is, the effects of

environment on the one hand and of heredity plus individual initiative on the other hand. For, other things equal, each mind responds according to its culture-status, considered as the resultant of heredity and initiative, so that most minds of given grade will tend to respond alike to like stimuli; yet the same mind may be so far dominated by environing conditions as to respond in particular directions according to somewhat higher or lower grades, rather than to that in which it properly belongs. But this is the special case; in general the recorded activital coincidences pertain to corresponding planes of thought coexisting independently among unrelated peoples.

On reviewing the trend of psychic progress, it is found to attend that somatic progress marked by cephalization and cheirization with such degree of closeness that the mental power of an ethnos or demos may be measured by the size of the average brain and the dexterity of the average hand; yet the sum of mental faculty appears to augment in more than a simple ratio with brain-growth and hand-development. The review also reveals a law of cumulation of knowledge, though present data do not warrant a quantitative formula; at the same time, it serves to elucidate certain puzzling activital coincidences, and to indicate the relative importance of resemblances and differences in mode of thinking. Finally, the review verifies and corroborates the testimony of lines of blood, and brings out the multiplicity of original streams of mentality, streams constantly blending and gaining strength by union.

So the general view of the volume of human experience concerning human mentality affords ample data for determining the general course of the current: it indicates that the sum of knowledge is increasing cumulatively, that thought is extending from man to man and from group to group and gaining force with each extension, and that all lines converge toward a plane higher than any yet attained.

Demonomy

The somatikos, with its dominant cerebral organ, is the mechanism of the human activities and at the same time an essential constituent of the collective human unit. While the human groups are many and diverse, they are conveniently combined in two categories: first, the natural or consanguineal or kinship group in which the unit is the ethnos; and second, the artificial or essentially social group in which the unit is the demos. The ethnos, or ethnic group, is the homologue of the varietal or specific group of animals; it is the dominant group in lower savagery, but its influence on human life wanes upward, to practically disappear in enlightenment except as retained in the structure of the family. The demos is the product of intelligence applied to the regulation of human affairs; it has no true homologue among animals; its importance waxes as that of the ethnos wanes from savagery through barbarism and civilization and thence into enlightenment.

The nature of the human activities in every stage is affected by the degree of development from the primeval ethnic condition toward the more advanced demotic condition; yet so many of the lines of human activity arose in the ethnic stage (to subdivide and ramify later) that the classification of activities must be broad enough to comprehend the two primary categories of collective units. At the same time, since the activities gained typical development only in the demotic condition; and, since their classification is framed especially to fit that higher condition, it is appropriate to characterize the activities as demotic, and to combine them in a system already known as Demonomy.

Five great groups of activities have been defined, and each of these has been arranged as the object-matter of a special science. The activities and special sciences are (1) activities giving pleasure, or arts: Esthetology; (2) activities promoting welfare, or industries: Technology; (3) activities uniting men, or institu-

tions: Sociology; (4) activities expressing thought, or languages: Philology; (5) activities for organizing knowledge, or philosophies: Sophiology. These activities and sciences have already been defined at length¹; accordingly nothing more than a brief outline of the sciences, with special reference to trend of activital development, seems now to be required.

Esthetology.—The pleasurable activities appear to arise normally with an exuberance proportionate to intelligence; and in demotic organization they appear to pass from person to person and from group to group, in a contagion beginning in appreciation and maturing in imitation, with a degree of rapidity also varying directly with intelligence. The conspicuous feature of the pleasure instinct, as expressed in individual experience and in the records of tradition and literature, is the constant out-reaching from the commonplace into the ideal, or the novel, or at least the unusual—that is, the key-note of the instinct is the insatiable hunger of humanity for better things. So the savage eye is caught by the gleam of the stars, by the glory of the sun, by the glitter of the gem, by the glint of light from distant peak or lake, as well as by brilliant color and definite shape; and his crude ideas are laxly spun into a pervasive mythology or more closely woven into growing concepts of grace and beauty. So, too, the barbaric eye is caught by the brilliant and remote, and idealization grows apace in the expanding mind, while the highly cultured harmonize colors and forms, and reach out among other races and nations for new motives; and in each stage the other sense organs combine with the eye in finding fresh ideals and bringing them into the permanent possession of the group. Now, the pleasure instinct, like all other things human, grows by exer-

¹ Vice-presidential address before the Anthropological Section of the American Association for the Advancement of Science, entitled "The Science of Humanity" (*Proceedings of the A. A. A. S.*, vol. XLVI, 1897, pp. 293-324; *American Anthropologist*, vol. X, 1897, pp. 241-272; *Science*, vol. VI, 1897, pp. 413-433, and *Scientific American Supplement*, vol. XLIV, 1897, pp. 18068-18070, 18083-18084, and 18121); also in the *Sixteenth Annual Report of the Bureau of American Ethnology*, 1897, pp. ix-xviii.

cise (save where sporadically suppressed by inaction) to the extent that each generation enjoys a richer heritage than any that went before, so that pleasure increases cumulatively, under a law no less definite than that general law of cumulation of knowledge of which it is a special expression. Man may be defined as the animal who laughs; it was with the advent of his kind that smiles and laughter came to be on earth; but the instinct and the means of happiness have continued to multiply with the passing generations, and to spread from people to people in a lightsome leaven permeating the primevally leaden lump with the natural germs of sympathy and affection; and in civilization and enlightenment the instrumentalities of pleasure are increased and multiplied to a number and potency hardly less than those of material welfare.

It is the property of pleasure to spring spontaneously in the human mind and to spread irrepressibly by normal impulse, the most powerful in human faculty; it is the quality of pleasure to warm sympathy and enkindle unity, and thus to prepare the way for the blending first of culture and then of blood throughout the realm of humanity; and the efficiency of pleasure, like that of the other activities, increases progressively with the cumulative growth of human knowledge.

Technology.—The industrial activities are the pillars of individual and collective welfare; they are manifestly inherited from a lowly ancestry, whose representatives sought food and shelter for self and kind with an avidity sharpened into cunning and refined into intelligence as the generations passed; yet, with the growth of intelligence in the human realm, the activities have ramified widely and risen to new planes far above the reach of the beast. Primarily, industries and pleasures are antithetic, since the former pertain especially to the ego, while the latter spread spontaneously from the ego outward; the activities of the one class are essentially centripetal, those of the other essentially centrifugal; the initial tendency of the indus-

tries is egoistic, that of the pleasures altruistic. Despite this primary distinction (pertaining especially to the progenitors, among whom pleasures must have been far subordinate), industries acquired a collective character even among the brutes, for, under the law of survival, maintenance of self grows into maintenance of kind; while in the realm of humanity it is the tendency of industries, vitalized as they are at every stage by the pleasures of life, to extend from self to family, thence to tribe and nation and race, and finally to the sum of human kind as successively larger and larger groups are united by common interests, common sympathies, and common knowledge. The key-note of industrial activity is hunger for material things; not necessarily better things, save as the instinct is brightened by the pleasure-instinct, yet for things good enough to maintain life and comfort. The early method is half-desperate essay or experiment, which guides future essay by its success or failure; a later method, pursued alike by beasts and lower men, is more hopeful essay guided by experience of others, and this matures in that imitation so characteristic of early culture and so influential in harmonizing tribe with tribe and nation with nation; the final method is confident essay under the guidance of both individual and collective experience (that is, the sum of available knowledge) along the lines involved—and this matures in invention, the highest expression of industrial activity. Hence, at first egoistic and centripetal, the industries of humanity tend constantly to pass under the domain of knowledge, to share its cumulative growth, and in time to become pleurably altruistic and centrifugal; and, in so far as they are controlled by knowledge, the industries become collective bonds, uniting men and nations, extending throughout the world, and gaining strength from generation to generation with the growth of human faculty.

So the function of industry is the maintenance of individual and collective life; its quality is first intensive, then extensive, and at last comprehensive; and its effect is to strengthen faculty

by exercise, and to extend and finally unite interests throughout the realm of humanity.

Sociology.—The institutions of human kind express that collectivity which demarks man most clearly from the brute. True, their germs bud in the subhuman family, as among the oranges and gorillas, whose family-group comprises a male protector and a female supporter of their own young; yet they expand cumulatively with the upwelling of the esthetic and the extension of the industrial, as well as with other factors involved in the growth of knowledge. The primary institutional bond appears to reside in maternal instinct, which is warmed by survival into a lax super-organic mechanism for the maintenance of kind through the nurture and protection of the young, and eventually grows by the survival of the affectionate and far-sighted into the maternal family-group or clan, in which the basis of organization is kinship traced in the female line; for it is not until knowledge has risen a long way up the genealogic tree of human development that the full meaning of the spasmodic pairing instinct is grasped and finally fixed by fully recognized paternity. With the enlargement of the family-group, the need for common protection arises and is met by spontaneous and mutual selection of leaders, and thus another institutional bond is woven; as the group enlarges and subdivides through the exigencies of food-quest or strife, sub-leaders are similarly chosen, and the idea of chiefship determined by prowess and shrewdness is developed; and eventually each individual in the group learns his or her place in the perfected hierarchy into which the group is forced by the interminable struggle between its own collective vitality and the great external. Commonly the incipient governmental organization is strengthened by differentiation of function, especially into warrior-protectors, who are generally males, and more plodding food-producers, who are generally females—though the domestic control is vested largely or wholly in the mothers of the groups until paternity is recognized. Another factor, born of the ceaseless

stress of fear on budding intelligence environed by infinite sources of tragedy, is an umbrage of mystery illumed only by the feeble light of actual knowledge at the center of the cloud investing lower man; as time passes the mystery is analyzed in terms of his small knowledge, and vaguely formulated as a hierarchy of mysteries, at first maleficent all but gradually becoming beneficent in part as his growing experience makes way for conquest over the erstwhile terrible unknown. Naturally some thinkers lead in forcing the environing mysteries, and are spontaneously chosen as chiefs of mystical craft; their function is to confront and conquer for the weal of their group the dim-peopled shadows of dark imagining; and in many tribes they are organized in a hierarchy of shamans often equal and sometimes far superior in power to the temporal hierarchy of civil chiefs. It is the duty of the shaman to encompass knowledge mystically, and the duty of the warrior and food-finder to encompass facts experimentally; and as knowledge develops under its cumulative law the mystery of paternity is solved, and the savage gains a new hold on the forces shaping his own career. Thenceforth the family organization becomes paternal, and savagery grows into barbaric culture. Scripture teaches that this type of culture grew into a patriarchal-priestly organization, and that under its beneficent influence population multiplied, raising problems of territorial tenure; classic history teaches that the territorial factor grew into a priestly cult represented by the god Terminus and the sacred landmark; while analysis of thought teaches that the conception of personal property-right necessarily awakened the idea of the correlative right of the neighbor—and the maturing concept found sacerdotal expression in the cult of Palestine, which quickly illumed the world, revolutionizing narrower institutions and marking the birth of civilization. The recognition of material right was followed in due course—albeit two millenniums later—by growing recognition of intellectual right; and another era in institutional progress began with the inauguration of gov-

ernment of the people by the people for the people. Thus, four stages in demotic development seemed to be clearly defined: (1) Savagery, with clan and tribal organization based on kinship traced in the female line, dominated by mysticism and shamanism; (2) Barbarism, with gentile institutions based on kinship traced in the male line, dominated largely by priestcraft; (3) Civilization, with national organization based on property-right, (especially territorial), initiated and controlled by a beneficent cult; (4) Enlightenment, with national institutions based on material and intellectual rights and the recognition of individuality. Throughout, the key-note of institutional activity is hunger for association for mutual pleasure and welfare; the primitive method is biotic association for the preservation of the kind; the higher and essentially human method is combination in ever increasing groups, with the ancillary exaltation of strength and knowledge, and growing recognition of the value of life. The main lines of progress are easily traced; the early law of might yields gradually to the higher law of right; hereditary despotism gives way to popular will; knowledge passes from the mystical to the real; tribes grow into nations, and nations into alliances; judgment is strengthened by exercise, and life grows easier and happier as needless bonds are broken and as equality blossoms neath liberty's rays.

So the function of the institution is the control and regulation of individual activity for the benefit of the group; and the quality of the institution is at first kindly and at last charitable. The tendency of the institution is to expand with the extension of pleasures and industries; and its effect is to combine humanity in larger and larger groups as the generations pass, yet ever to lighten its own chains with the growth of individual knowledge and kindliness.

Philology.—Language appears to arise spontaneously among the brutes in the form of inarticulate cries of fright or pain, or perchance expressing the mere joy of living or the glory of virile

strength; but even in the lowest known examples of humanity, vocal utterance is articulated, differentiated into phonetic forms, diversified lexically and structurally, and supplemented by pantomimic or graphic devices or by both. Commonly the languages of the more primitive living groups express ideas in terms of egocentric association, as in the kinship terminology which expresses relative position or rank throughout the group, while the languages of the higher groups are commonly richer and more definite in vocabulary, and more or less devoid of associative connotation and structure; so that it seems fair to measure linguistic growth by the development of words as definite symbols of discrete ideas, and by the concomitant elimination of inflexional and other associative devices. The sematic simplification of language is coupled with that phonetic simplification (the effect of intuitive economization) which distinguishes all higher tongues from lower—e. g., a highly developed language may be written phonetically in an alphabet of some forty characters or less, and all the strong modern languages may be written in twice as many, while it has been estimated (by Dorsey) that the aboriginal American languages would require three hundred or more characters for adequate phonetic expression.

The primary function of language is the transmission of ideas, at first vague but ever increasing in definiteness with growth of knowledge, so that the quality of language is essentially collective; under primitive conditions the linguistic tie may be limited largely to the family-group, though the analogy of the singing bird and roaring beast suggests a mating-motive extending the vocal function from family to family in ever widening circles—certainly the vocal tie of savagery and barbarism warms into the most delicate and significant of intertribal bonds, bonds eventually fixed by endogamic and exogamic regulations and limited by community of faith. The vehicle of thought in every stage of development, language reacts on the mind and gives final shape to thought, howsoever rough-hewn; thus it is the

effect of language to harmonize opinions, to bring individuals and groups into closer accord, to integrate pleasures and industries and institutions and, in the last analysis, to unify mankind.

Sophiology.—In every stage of human development, current knowledge is synthesized in the form of philosophies, or systems of opinion or belief; initially the act of synthesis seems to be normal and spontaneous as youthful playfulness, an expression of hunger for better things intellectual; later the instinct is controlled by the products of its own activity, much as pleasures are regulated by the devices involved in the pursuit of pleasure. In each stage, current philosophy conforms to the fundamental law of knowledge; by reason of its spontaneous quality it upwells and expands constantly, like its offshoot plant of poesy that doth feed upon itself; by reason of its function as the synthetic bond and essence of the simpler activities, it spreads from man to man and from group to group, steadily eliminating its own incongruities through the attrition of contact; by reason of its natural tendency to follow the paths of least resistance, it serves to bring mental operations into conformity with the processes of nature, and eventually to exalt the mind of man to its true place (so clearly seen by Bacon) as first the mirror and then—as passive coördination grows into forceful coördination—the master of nature; and by reason of its tendency toward diffusion, synthesized knowledge tends to combine men and groups in ever larger and more sympathetic units, and so to unify humanity.

The demotic activities in general.—When the several human activities are scanned separately, their tendencies are easily traced; all diverge in form, yet converge in essential quality and in their effects on mankind; and when the several categories of activities are juxtaposed their trend is still more clearly displayed—for all the main lines are convergent. Comparison between the lines of human progress and the lines of biotic evolution is especially significant, since the essentially biotic lines diverge toward infinite differentiation, while the essentially human lines converge toward

union; and herein appears to lie the break between the biotic realm and the human realm, as seen from the standpoint of the phylogenist. Comparison of the activital lines with the lines of psychic development is even more instructive, since the trend is similar; and this correspondence seems at once to define the realm of humanity as coincident with the domain of intellectuality, and to extend the law of the cumulation of knowledge over the entire range of the human activities. Under this view, human faculty is seen to transcend the realm of the inorganic, no less completely than the realm of the biotic, in that its fundamental character rises above the mere indestructibility of matter, even above the simple persistence of motion, in a law of cumulative growth; yet it were but mental atavism to invest this law with mystery, or do else than seek to formulate it in quantitative terms.

The convergent trend of each and every series of human activities bears directly on the much-discussed question of the origin of the genus *Homo*. It cannot be affirmed too emphatically that critical observations on mankind indicate convergence of somatic and psychic and demotic characters, and that no careful observations indicate divergence of the essential characters of mankind—indeed it is a commonplace fact that all the lines of human culture, like most of the lines of human blood, are blending more or less rapidly and that neither culture nor blood is becoming divergent in any part of the world. The process of blending seems to be cumulative under the law of humanity; and no shadow of warrant appears for assuming any other trend during the history of human development. It follows that the theory of monogenism is devoid of direct or indirect observational basis, and that the polygenetic theory is supported by the sum of available facts. In view of the evidence, it would appear practically certain that *Homo* came up independently from a widely distributed protohuman ancestry in at least as many centers as there are races or varieties of his genus; and the law of cumulative

growth, taken in connection with the various culture stages now existing, indicates that the transition was by no means contemporaneous—that, e. g., the progenitors of the white man must have been well past the critical point before the progenitors of the red and the black arose from the plane of bestiality to that of humanity.

The Advance of Culture

Classed in terms of blood, the peoples of the world may be grouped in several races; classed in terms of what they *do* rather than what they merely *are*, they are conveniently grouped in the four culture grades of savagery, barbarism, civilization, and enlightenment.

Considered as races, the peoples are evidently approaching community, partly through blending of blood, partly through the more rapid extinction of the lower races who lack the strong constitution (developed through generations of exercise) enjoyed by the higher races; so that the races of the continents are gradually uniting in lighter blend, and the burden of humanity is already in large measure the White Man's burden—for, viewing the human world as it is, white and strong are synonymous terms.

Still more significant is the trend of progress descried when the people of the world are considered as representatives of the four culture grades; for the lamp of civilization and the sun of enlightenment are shining on the dark-skin peoples no less strongly (albeit somewhat less effectively) than on those of white skin, and all are rising steadily into the higher grades. Even below the plane in which enlightenment is an appreciably efficient factor in shaping progress, the savage is acquiring, both spontaneously and through association, the knowledge required to raise him into the higher grade of barbarism, while the shackles of barbaric organization are slowly wearing weaker through normal processes. The 1,500,000,000 people of the world are increasing from decade to decade in number, and still more rapidly in efficiency as indi-

vidual units of humanity ; during each decade the relative increase in both directions is most rapid among enlightened citizens and decidedly slower among civilization's subjects, while the barbarians gain little if any and the savages lose ; during each decade the gain of the higher grades and the loss of the lower may be traced partly to the longer life of the better-cultured, partly to the advance of lower people into the higher grades ; and during each decade average viability and average intelligence, as well as average population, are increased—and when the decades are compared, the increase is found to be cumulative, so far as the figures are trustworthy.

So when human experience concerning human blood and human culture is synthesized, and when the sum is analyzed into its simplest elements, a single trend is seen : The blood of the races is blending slowly, yet with steadily increasing rapidity, while the culture of the world is blending still more rapidly than the blood ; the blood-blending may be sometimes injurious, though it is more frequently beneficial, while the culture-blending is rarely followed by deterioration of the better, commonly attended by improvement of the worse ; and human culture is becoming unified, not only through diffusion but through the extinction of the lower grades as their representatives rise into higher grades.

Such seems to be the Trend of Human Progress.

THE CEPHALIC INDEX

By FRANZ BOAS

I

The top views of the skulls of the races of man show great differences in form. For this reason the shape of the skull has come to be one of the best-studied racial characters. The more or less elongated form of the skull has been proved to be a good means of characterizing varieties of man. The degree of elongation is concisely expressed by the proportion between the antero-posterior diameter or length and the transversal diameter or breadth of the skull. Generally the latter diameter is expressed in percents of the former, and this value is called the cephalic index. The object of the following investigation is a study of the biological significance of this index.

The statement that in a certain race the breadth of the skull is, on the average, a certain percentage of its length, would seem to imply that there exists a certain characteristic relation between length and breadth, so that individuals of a certain length of head would, on the average, have a breadth of head corresponding to the length multiplied by the cephalic index. It is well known that this is not the case, but that the heads which have absolutely the greatest lengths have the lowest indices. I have obtained the following results from a study of 239 Sioux Indians which were measured for me by Mr G. H. Kaven in 1892:

<i>Number of Individuals.</i>	<i>Length of Head.</i>	<i>Correlated Cephalic Index.</i>
11	180-184 mm.	84.9
35	185-189	81.5
86	190-194	79.9
70	195-199	78.3
25	200-204	77.6
12	205-210	75.9

The cephalic index is also greatly influenced by causes other than the length and breadth of head. A comparison of stature, height of face, and breadth of face with the cephalic index of the same series of Sioux Indians, is given in the following table:

<i>Number of Individuals.</i>	<i>Stature, (mm.)</i>	<i>Correlated Cephalic Index. (%)</i>	<i>Number of Individuals.</i>	<i>Height of Face, (mm.)</i>	<i>Correlated Cephalic Index. (%)</i>	<i>Number of Individuals.</i>	<i>Breadth of Face, (mm.)</i>	<i>Correlated Cephalic Index. (%)</i>
16	1600-1649	81.6	27	115-119	78.8	18	135-139	78.3
49	1650-1699	78.9	71	120-124	80.0	44	140-144	78.5
86	1700-1749	79.4	60	125-129	80.2	85	145-149	78.6
68	1750-1799	79.6	55	130-134	79.1	85	150-154	80.5
19	1800-1849	78.4	16	135-139	78.1	17	155-159	81.1

Although these values do not change quite regularly, they clearly show correlations between the three measurements which I selected and the cephalic index.

The index—like all other indices—is a complex value depending, as it does, on two measurements. In order to gain an insight into its significance, it will be best to investigate the correlations of its constituent elements. The correlation of length and breadth of head, determined from a series of 923 male adult Indians of the Sioux, Ojibwa, and Crow tribes, is as follows:

<i>Group.</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>
Length of Head (mm.)	180-184	185-189	190-194	195-199	200-204	205-209
Average Breadth of Head.	153.8	153.5	154.8	156.2	157.8	159.4

This table shows that the average breadth of head of individuals whose length of head is very great or very small, differs little from the average breadth.

When we investigate the correlation of length and breadth of head with stature, it is found that the length of head is more influenced by stature than the breadth of head. Correlation between breadth of face and horizontal diameters of the head shows the two transversal diameters to be very closely correlated, while the length of head is more closely correlated with height of face. The following table illustrates these observations:

243 Sioux Indians. (Adult males, 20-59 years.)

<i>Number of Individuals.</i>	<i>Stature.</i> (mm.)	<i>Correlated Length of Head.</i> (mm.)	<i>Correlated Breadth of Head.</i> (mm.)	<i>Number of Individuals.</i>	<i>Height of Face.</i> (mm.)	<i>Correlated Length of Head.</i> (mm.)	<i>Correlated Breadth of Head.</i> (mm.)
16	1600-1649	187.5	153.1	27	115-119	191.3	150.9
49	1650-1699	193.3	152.6	51	120-124	192.1	154.8
86	1700-1749	194.1	154.3	60	125-129	193.3	154.6
68	1750-1799	194.5	155.3	33	130-134	196.0	154.7
19	1800-1849	196.5	154.3	10	135-139	198.7	155.5
		<i>Number of Individuals.</i>	<i>Breadth of Face.</i> (mm.)	<i>Correlated Length of Head.</i> (mm.)	<i>Correlated Breadth of Head.</i> (mm.)		
		8	135-139	187.8	147.3		
		44	140-144	190.9	150.1		
		85	145-149	194.4	152.9		
		86	150-154	194.5	156.5		
		67	155-159	197.1	160.0		

When we wish to consider the joint influences of all these causes upon either length or breadth of head, we must subdivide each group according to the varying values of the new cause and calculate the correlated averages of the breadth of head. It will be seen at once that, in order to carry on the investigation in this manner, practically unlimited material must be available, otherwise the number of individuals in each class will be very small, owing to the great number of classes. Problems of this kind were first discussed by Francis Galton,¹ but the method of treatment has been fully developed by Karl Pearson.²

It may be well, on account of the importance of this method, to give an elementary deduction. The correlations of several organs are to be investigated, the first of which has the average value l_1 . The various observed values of this organ may be expressed by $l_1 + x_1$, where x_1 designates the difference between an observed value and the average value. The second, third, and fourth organs have the average values, respectively, l_2, l_3, l_4, \dots

¹ *Natural Inheritance.*

² *Mathematical Contributions to the Theory of Evolution*, III: Philosophical Transactions of the Royal Society of London, vol. 187, pp. 253 ff.

and the observed values may be expressed by $l_2 + x_2, l_3 + x_3, l_4 + x_4, \dots$. The values x_1, x_2, \dots are determined by a great many very small causes which we will call ε . Then we may say—

$$\begin{aligned}x_1 &= \alpha_{11} \varepsilon_1 + \alpha_{12} \varepsilon_2 + \alpha_{13} \varepsilon_3 + \dots \\x_2 &= \alpha_{21} \varepsilon_1 + \alpha_{22} \varepsilon_2 + \alpha_{23} \varepsilon_3 + \dots \\&\vdots \\x_n &= \alpha_{n1} \varepsilon_1 + \alpha_{n2} \varepsilon_2 + \alpha_{n3} \varepsilon_3 + \dots\end{aligned}$$

where the α are constants. When we wish to investigate the correlations of the series of organs with the first organ, we may substitute the value of ε_1 from the first equation and we find:

$$(1) \quad \begin{cases} x_2 = q_{21} x_1 + \beta_{12} \varepsilon_2 + \beta_{13} \varepsilon_3 + \dots \\ \vdots \\ x_n = q_{n1} x_1 + \beta_{n2} \varepsilon_2 + \beta_{n3} \varepsilon_3 + \dots \end{cases}$$

Here the q and β are new constants which result from the substitution. Since the causes ε are subject to chance only, their averages will disappear. If, then, we assume x_1 to be constant, we have

$$(2) \quad \text{Average } x_n = q_{n1} x_1.$$

Now we will form the products $x_1 x_n$. These may be arranged in such order that all the x_1 that have equal values shall be grouped together. Then each of these values for x_1 will be multiplied by the sum of all the correlated values of x_n . Supposing there are p individuals in which the first organ has the deviation from its average x_1 , we may substitute for the sum of all the correlated values x_n p times the average of x_n , or according to (2), $p q_{n1} x_1$. Therefore the sum total

$$\sum x_1 x_n = \sum x_1 q_{n1} x_1 = \sum q_{n1} x_1^2.$$

Now, the sum of all the x_1^2 is equal to the mean square variation (or standard variation) of l_1 , which we will call μ_1 . Therefore

$$\sum x_1 x_n = \sum q_{n1} \mu_1^2,$$

or when n the total number of individuals measured

$$= n q_{n1} \mu_1^2.$$

We can show, in the same manner, that

$$\sum x_1 x_n = n q_{n1} \mu_n^2.$$

Therefore

$$q_{n1} \mu_1^2 = q_{n1} \mu_n^2.$$

We will call

$$q_{n1} = r \frac{\mu_n}{\mu_1};$$

Then

$$q_{1n} = r \frac{\mu_1}{\mu_n}, \quad \text{and}$$

$$\sum x_1 x_n = n r \mu_1 \mu_n$$

(3)

$$r = \frac{\sum x_1 x_n}{n \mu_1 \mu_n}$$

We call r the coefficient of correlation, q the coefficient of regression, because it measures the regression of the correlated value toward the average.*

It remains to determine the variability of the array of values x_n which are correlated to a given value x_1 . According to (1) this variability does not depend upon x_1 , since the z are not functions of x_1 , but are entirely independent. The variability of each array is equal to the mean square of the differences between the members of the array and their average. The latter is $l_n + q_{n1} x_1$, while the value for each member of the array is $l_n + x_n$. Their difference is

$$x_n - q_{n1} x_1$$

and the mean square variability of the array

$$\begin{aligned} \sum (x_n - q_{n1} x_1)^2 &= \sum x_n^2 + \sum q_{n1}^2 x_1^2 - 2 \sum x_n q_{n1} x_1 \\ &= \sum x_n^2 - \sum q_{n1}^2 x_1^2. \end{aligned}$$

Since the value on the left-hand side of this equation remains the same for all values of x_1 , we may substitute for it ρ , the variability of the array. If we form the sum of these equations for all the values of x_1 , we have

$$\begin{aligned} \sum x_n^2 &= n \mu_n^2 \\ \sum x_1^2 &= n \mu_1^2. \end{aligned}$$

Therefore

$$\begin{aligned} n \rho^2 &= n \mu_n^2 - n q_{n1}^2 \mu_1^2 \\ \rho &= \mu_n \sqrt{1 - r^2} \end{aligned}$$

* See Galton, *Natural Inheritance*, pp. 95 ff.

II

We will apply this result to a discussion of the correlation between length and breadth of head. Pearson¹ has calculated the following data :

<i>Adult Male Crania :</i>	
Ancient Egyptians (Flinders-Petrie).....	0.2705
Bavarian peasants (Ranke).....	0.2849
Modern Parisians (Broca).....	0.0474

I have calculated the coefficients of correlation for the following series :

Sioux, living, 243 adult males.....	+ 0.24
Skulls of 57 adult male Sioux Indians ²	+ 0.24
Skulls of 47 adult male Eskimo, Smith sound ³ ...	+ 0.47
Indians of the northern coast of British Columbia :	
adult males.....	+ 0.08
Shuswap Indians ; adult males.....	+ 0.04
Skulls of adult males, Baden ⁴	+ 0.09
Bāgdi caste of Bengal ; adult males ⁵	+ 0.13

It appears from these data that the degree of correlation between length and breadth of the head is very slight, and that its values differ considerably among various races. The latter fact is rather surprising, since we might expect that in the human species the same organs are subject to the same laws. The coefficient of correlation in the Parisians, for instance, is exceedingly low, in fact so low that we may say that the breadth of head in the Parisians is entirely independent of the length of head.

The most plausible explanation of this phenomenon lies in the effect of mixture of types upon the coefficient of correlation.

¹ *Loc. cit.*, pp. 279, 280.

² George L. Otis, *List of Specimens in the Anatomical Section of the U. S. A. Medical Museum*, 1880, pp. 104 ff.

³ *Ibid.*, pp. 9 ff.

⁴ *Die Schädel in der Grossherzoglichen Anatomischen Anstalt zu Heidelberg ; Archiv für Anthropologie*, vol. 24, pp. 24 ff.

⁵ H. H. Risley, *The Tribes and Castes of Bengal*, vol. 1, pp. 16 ff.

Supposing two types which have the measurements l_1, l_2, \dots, l_n , and $\lambda_1, \lambda_2, \dots, \lambda_n$, respectively, inhabit the same area, so that it is impossible to determine to what type each individual belongs. If the component types are not known, we should find for the whole series the averages L_1, L_2, \dots, L_n with the variabilities M_1, M_2, \dots, M_n , and the coefficient of correlation calculated according to the method given above would be

$$R = \frac{\sum X_1 X_2}{n M_1 M_2}$$

If we divide this sum into two groups, the one embracing all the individuals of one type, the other those of the other type, we may substitute for the former

$$\begin{aligned} L_1 + X_1 &= l_1 + x_1, & X_1 &= l_1 - L_1 + x_1 \\ L_n + X_n &= l_n + x_n, & X_n &= l_n - L_n + x_n \end{aligned}$$

for the latter

$$\begin{aligned} L_1 + X_1 &= \lambda_1 + \xi_1, & X_1 &= \lambda_1 - L_1 + \xi_1 \\ L_n + X_n &= \lambda_n + \xi_n, & X_n &= \lambda_n - L_n + \xi_n \\ R &= \frac{\sum (x_1 + l_1 - L_1)(x_n + l_n - L_n)}{n M_1 M_n} + \frac{\sum (\xi_1 + \lambda_1 - L_1)(\xi_n + \lambda_n - L_n)}{n M_1 M_n} \\ &= \frac{\sum x_1 x_n}{n M_1 M_n} + \frac{\sum \xi_1 \xi_n}{n M_1 M_n} + \frac{n_1 (l_1 - L_1)(l_n - L_n) + n_2 (\lambda_1 - L_1)(\lambda_n - L_n)}{n M_1 M_n} \end{aligned}$$

and by substituting the values of r_1, r_n and of

$$\begin{aligned} L &= \frac{n_1 l + n_2 \lambda}{n} \\ R &= r_1 \frac{n_1 \mu_1 \mu_n}{n M_1 M_n} + r_n \frac{n_2 \mu_1' \mu_n'}{n M_2 M_n} + \frac{n_1 n_2 (l_1 - \lambda_1)(l_n - \lambda_n)}{n^2 M_1 M_n} \end{aligned}$$

Supposing that in the component elements of the series r_1 and r_n , μ_1 and μ_1' , μ_n and μ_n' are equal, we have

$$R = r \frac{\mu_1 \mu_n}{M_1 M_n} + \frac{n_1 n_2 (l_1 - \lambda_1)(l_n - \lambda_n)}{n^2 M_1 M_n}$$

It will be noticed that whenever the second term of this sum

is negative, R will be less than r . This will be the case when l_1 is larger than λ_1 and l_2 smaller than λ_2 , or vice versa.

I think this effect of mixture is a sufficient explanation of the low value of the coefficient of correlation for Paris, where we find a very heterogeneous population embracing narrow- and long-headed subjects from northern France and very broad- and short-headed ones from southern France. The same explanation seems plausible for the Shuswap and the tribes of northern British Columbia. The high value for Eskimo skulls may be due to the fact that a number of female skulls were counted as male skulls. This would have the effect of raising the coefficient of correlation between the diameters of the head.

When the type is dis-homogeneous owing to mixed descent, the coefficient of correlation will depend upon the law of heredity. If the mixed race should range in a probability curve around a type intermediate between the parental types, we should expect to find the coefficient of correlation slightly influenced by mixture, if any. If the mixture should result in a tendency of reversion to either parental type, the effect would be similar to that observed in the case of mechanical mixture which was discussed before. Evidently in such cases the coefficient of correlation has no direct biological significance.

III

It is quite evident that both breadth and length of head are influenced by a great number of causes, some of which act upon both measurements in the same manner, while others may influence each in a peculiar way. Such causes may be investigated by determining their correlations with length and breadth of head separately. Thus, we may determine the correlation between capacity of skull, stature, dimensions of face, and the two diameters of the head. I have calculated a number of such correlations for adult males of a few Indian tribes with the following results:

Coefficient of Correlation.

	<i>Indians of Northern Coast of British Columbia.</i>	<i>Shuswap Indians.</i>	<i>Sienx Indians.</i>
Stature and Length of Head.....	.....	....	+ 0.26
Stature and Breadth of Head.....	.....	....	+ 0.09
Breadth of Face and Length of Head..	+ 0.30	+ 0.28	+ 0.27
Breadth of Face and Breadth of Head..	+ 0.53	+ 0.62	+ 0.52
Height of Face and Length of Head..	+ 0.24	+ 0.27	+ 0.36
Height of Face and Breadth of Head..	- 0.10 ¹	+ 0.22	+ 0.22

If we desire to eliminate the influences of these causes from the *apparent* correlation between length and breadth of head, we must consider each of these a function not only of the other, but also of all the measurements the effect of which we desire to exclude. In doing so, we may pursue the same method that we used in the beginning (p. 450) and by a series of substitutions in (1) we find

$$(4) \text{ Average } x_1 = q_{110} \dots p x_2 + q_{120} \dots p x_3 + \dots + q_{1p0} \dots (p-1) x_p$$

The values q may be determined in the following manner. We will call

$$(5) \quad q_{100} \dots = r_{100} \dots \cdot \frac{\mu_1}{\mu_0}$$

By multiplying (4) successively with $x_2, x_3 \dots x_p$, we have

$$(6) \quad \begin{cases} r_{12} = r_{102} \dots p + r_{120} \dots p r_{20} + \dots + r_{1p0} \dots (p-1) r_{p0} \\ r_{13} = r_{103} \dots p r_{03} + r_{123} \dots p + \dots + r_{1p3} \dots (p-1) r_{p3} \\ \vdots \\ r_{1p} = r_{10p} \dots p r_{0p} + r_{12p} \dots p r_{2p} + \dots + r_{1p0} \dots (p-1) \end{cases}$$

By multiplying the last of these equations successively by $r_{p+1}, r_{p+2} \dots$ and subtracting from the first, second \dots equation, we find

$$\begin{aligned} r_{12} - r_{1p} r_{p2} &= r_{102} \dots p (1 - r_{2p} r_{p2}) + r_{120} \dots p (r_{20} - r_{2p} r_{p2}) \\ &\quad + \dots + r_{1(p-1)0} \dots p (r_{(p-1)0} - r_{(p-1)p} r_{p2}) \\ &\quad \vdots \end{aligned}$$

¹ This low value may be due to the cause that on the coast of British Columbia two types come into contact, one with a very high face, the other with a low face. Their mixture would probably result in a decrease of the correlations for height of face in the mixed race.

We call

$$\begin{aligned}
 \frac{r_{12} - r_{12} r_{2p}}{1 - r_{2p} r_{2p}} &= r_{12(p)} \\
 \frac{r_{13} - r_{13} r_{3p}}{1 - r_{3p} r_{3p}} &= r_{13(p)} \quad \text{etc.}
 \end{aligned}$$

$$(7) \quad \left\{ \begin{aligned} r_{1(p)} &= r_{12} + \dots + r_{12(p-1)p} + r_{13} + \dots + r_{13(p-1)p} + \dots + r_{1(p-1)p} + r_{1(p-1)p} \\ r_{2(p)} &= r_{23} + \dots + r_{23(p-1)p} + r_{24} + \dots + r_{24(p-1)p} + \dots + r_{2(p-1)p} + r_{2(p-1)p} \\ &\vdots \\ r_{(p-1)p} &= r_{(p-1)p} + r_{(p-1)p} + r_{(p-1)p} + \dots + r_{(p-1)p} + r_{(p-1)p} \end{aligned} \right.$$

It will be seen that (7) is identical with (6) except insofar as to all the r representing correlations between two measurements, the element p has been added, and insofar as the number of equations and of unknown quantities has been decreased by one. We may, therefore, continue a series of successive substitutions which will always result in equations of the same form. The next substitution would be

$$r_{12(p-1)p} = \frac{r_{12p} - r_{12(p-1)p} r_{(p-1)p}}{1 - r_{(p-1)p} r_{(p-1)p}}$$

The last substitution will give us

$$r_{12 \dots p} = \frac{r_{12(45 \dots p)} - r_{12(45 \dots p)} r_{45 \dots p}}{1 - r_{45 \dots p} r_{45 \dots p}}$$

Thus the coefficients of correlation between p variables may be reduced to those between $(p-1)$ variables.

The variability ρ of the array of x_1 which is correlated to a series of values for x_2, x_3, \dots

$$\begin{aligned}
 \rho^2 &= \text{Average of } (x_1 - q_{12} \dots x_2 - q_{13} \dots x_3 - \dots)^2 \\
 &= \text{Average of } (x_1^2 + q_{12}^2 \dots x_2^2 + q_{13}^2 \dots x_3^2 + \dots \\
 &\quad - 2q_{12} \dots x_1 x_2 - 2q_{13} \dots x_1 x_3 - \dots \\
 &\quad + 2q_{12} \dots q_{13} \dots x_2 x_3 + \dots)
 \end{aligned}$$

By substituting the values of the types r and μ^2 for the averages of the types xx and x^2 and for q its related r , according to (5), we find

$$\begin{aligned}
 \rho^2 &= \mu_1^2 (1 + r_{12}^2 \dots + r_{13}^2 \dots + \dots \\
 &\quad - 2r_{12} \dots r_{12} - 2r_{13} \dots r_{13} - \dots \\
 &\quad + 2r_{12} \dots r_{13} \dots r_{23} + \dots)
 \end{aligned}$$

By introducing in the negative elements of this sum the values for r_{12}, r_{13}, \dots from (6), we obtain

$$(8) \rho^2 = \mu_1^2 (1 - r_{12}^2 - r_{13}^2 - \dots - r_{1p}^2 - 2r_{12} \dots r_{13} \dots r_{1p} - \dots),$$

or in a shorter form

$$\rho^2 = \mu_1^2 [1 - \sum (r_{1a} \dots r_{1b} \dots r_{1p})],$$

in which sum a and b must be made to assume all the values from 2 to p .

IV

I have treated, according to this method, the measurements of the 57 skulls of adult male Sioux Indians to which I referred above (page 453). I have compared length (l) and breadth (b) of skull with its height (h), the bizygomatic diameter of the face (s), and with the capacity of the skull. For the last purpose I have made a reduction which seemed necessary, because the capacity of the skull is a cubic measure, while all the others are linear measures. For this reason I have compared the latter with the cubic root of the capacity of the skulls (c). The averages and variabilities of these measurements are as follows:

	c	l	b	h	s
Average (mm.).....	112.9	181.7	143.5	133.0	141.6
Standard variability....	± 2.6	± 6.3	± 5.6	± 4.7	± 6.3

The following coefficients of correlation were found:

I. Coefficients of Single Correlation.

Determined by:

	c	l	b	h	s
Average c$.....	....	+0.54$	$+0.67$	$+0.44$	$+0.49$
Average l	$+0.54$	....	$+0.24$	$+0.36$	$+0.39$
Average b	$+0.67$	$+0.24$	....	0.00	$+0.61$
Average h	$+0.44$	$+0.36$	0.00$	....	+0.19$
Average s	$+0.49$	$+0.39$	$+0.61$	$+0.19$	....

It appears from this table that the correlations of the diameters with the capacity are strongest, while that between length and breadth is one of the lowest values in the table. This condition is still more strongly brought out when double, triple, and quadruple correlations are considered.

II. *Coefficients of Double Correlation.*

Average <i>c</i> Determined by:				Average <i>l</i> Determined by:				Average <i>h</i> Determined by:			
<i>l</i>	<i>b</i>	<i>h</i>	<i>z</i>	<i>c</i>	<i>b</i>	<i>h</i>	<i>z</i>	<i>c</i>	<i>l</i>	<i>h</i>	<i>z</i>
+0.30	+0.57	.....	.....	+0.69	-0.22	.....	.....	+0.76	-0.17	.....	.....
+0.44	.....	+0.29	.....	+0.47	.....	+0.15	.....	+0.83	.....	-0.36	.....
+0.41	.....	.....	+0.33	+1.46	.....	.....	+0.17	+0.49	.....	.....	+0.37
.....	+0.67	+0.44	.....	.....	+0.24	+0.36	.....	.....	+0.28	-0.10	.....
.....	+0.59	.....	+0.13	.....	0.00	.....	+0.38	.....	0.00	.....	+0.61
.....	.....	+0.36	+0.43	.....	.....	+0.30	+0.33	.....	.....	-0.13	+0.04
Average <i>b</i> Determined by:				Average <i>z</i> Determined by:							
<i>c</i>	<i>l</i>	<i>b</i>	<i>z</i>	<i>c</i>	<i>l</i>	<i>b</i>	<i>h</i>				
+0.35	+0.17	.....	.....	+0.39	+0.18	.....	.....		
+0.80	.....	-0.53	.....	+0.15	.....	+0.51	.....			
+0.46	.....	.....	-0.04	+0.51	.....	.....	-0.04				
.....	+0.38	-0.10	.....	.....	+0.20	+0.55	.....			
.....	+0.34	.....	+0.06	.....	+0.37	.....	+0.06				
.....	.....	-0.19	+0.30	.....	.....	+0.61	+0.19				

III. *Coefficients of Triple Correlation.*

Average <i>c</i> Determined by:				Average <i>l</i> Determined by:				Average <i>h</i> Determined by:			
<i>l</i>	<i>b</i>	<i>h</i>	<i>z</i>	<i>c</i>	<i>b</i>	<i>h</i>	<i>z</i>	<i>c</i>	<i>l</i>	<i>h</i>	<i>z</i>
+0.28	+0.54	+0.35	.....	+0.63	-0.17	+0.09	.....	+0.89	-0.11	-0.36	.....
+0.41	+0.59	.....	-0.03	+0.65	-0.38	.....	+0.29	+0.60	-0.25	.....	+0.41
+0.32	.....	+0.27	+0.32	+0.39	.....	+0.16	+0.17	+0.66	.....	-0.37	+0.36
.....	+0.67	+0.45	0.00	.....	+0.06	+0.31	+0.39	.....	+0.04	-0.14	+0.63
Average <i>b</i> Determined by:				Average <i>z</i> Determined by:							
<i>c</i>	<i>l</i>	<i>b</i>	<i>z</i>	<i>c</i>	<i>l</i>	<i>b</i>	<i>h</i>				
+0.75	+0.07	-0.53	.....	-0.04	+0.28	+0.58	.....			
+0.37	+0.19	.....	-0.07	+0.43	+0.19	.....	-0.06				
+0.78	.....	-0.65	+0.25	0.00	.....	+0.61	+0.18				
.....	+0.34	-0.19	+0.18	.....	+0.22	+0.56	+0.12				

IV. *Coefficients of Quadruple Correlation.*

Determined by	<i>c</i>	<i>l</i>	<i>b</i>	<i>h</i>	<i>z</i>	Variability of Array.
Average <i>c</i>..	.....	+0.32	+0.67	+0.36	-0.08	of <i>c</i> = 0.47 μ_c
Average <i>l</i> ..	+0.63	.....	-0.36	+0.03	+0.29	of <i>l</i> = 0.79 μ_l
Average <i>b</i> ..	+0.69	-0.16	.....	-0.52	+0.41	of <i>b</i> = 0.54 μ_b
Average <i>h</i> ..	+0.77	+0.03	-0.65	.....	+0.18	of <i>h</i> = 0.78 μ_h
Average <i>z</i> ..	-0.17	+0.27	+0.70	+0.19	.....	of <i>z</i> = 0.69 μ_z

These data show that the diameters of the skull are primarily determined by its capacity. The height of the skull appears to be most closely associated with its capacity, the length seems to be least closely related to it. I presume this is due to the fact

that the development of the frontal sinuses and of the occipital protuberances does not depend upon the form of the inner cavity of the skull, but upon the general development of the skeleton. Since this is partly expressed by stature, we might expect that this influence would partly be eliminated by the introduction of stature in the series of correlations. Unfortunately this element cannot be introduced on account of lack of data. Furthermore, the errors of the values of multiple correlations are so great that it is not advisable to carry on the investigation of a series of no more than 57 skulls beyond quadruple correlations which may be considered approximately correct in their first decimal.

It is of great interest to note that when capacity is introduced in our consideration a compensatory growth is found to exist between breadth of head on the one hand, and height and length of head on the other. We find, therefore, as a result of our investigation, that the law of compensation which Virchow formulated after an analysis of the forms of skulls with premature synostosis of sutures, holds good also in normal skulls. *Among skulls belonging to the same type a breadth above the average is compensated by a height and a length below the average.* The correlation between length and breadth is not an expression of a biological relation between the two measurements, but an effect of the changes which both undergo when the capacity of the skull increases or decreases. The cephalic index, therefore, is not the expression of a law of direct relation between length and breadth of the skull. The proportion between the diameters of the skull and its capacity, on the other hand, expresses an intimate biological relation between these measurements. It appears that the diameters of the head must be considered as due to the tendency of the inner cavity of the skull, or more probably of the brain, to assume a certain size and form in a given type of man, this form being expressed by the proportion of the diameters of the brain and its size. If one of the diameters differs from the norm in being excessively large, the others will

tend to be too small. This is definitely shown to be the case when the transversal diameter differs from the norm.

The variabilities of the arrays show that the reduction of variability of capacity is greatest. This proves that the four linear measurements which we have treated largely determine the capacity. The variability of the length and height of skull is very slightly reduced. This shows that these measurements are largely influenced by causes which we have not included in our considerations. The same is true of the bizygomatic diameter of the face. When we compare the reduction in variability of the linear measurements as determined by c , and as determined by the quadruple correlation, we find the following:

<i>Variability of Array.</i>		
	<i>Determined by c.</i>	<i>Determined by Quadruple Correlation.</i>
l	0.84	0.79
b	0.74	0.54
h	0.90	0.78
z	0.87	0.69

This comparison proves that breadth, height, and bizygomatic diameter have an insignificant effect upon length as compared with the effect of capacity. The great reduction of variability for breadth of head and bizygomatic diameter is due to the intimate correlation between these two values.

It follows from these considerations that while the cephalic index is a convenient practical expression of the form of the head, it does not express any important anatomic relation. On the other hand, the relation between capacity and head diameters is found to be of fundamental importance, and among these the relation between transversal diameter and capacity is most significant. Since in measurements on the living we are unable to measure capacity of the head, it is necessary to find a substitute. It would seem that circumferences are the most available means for judging cranial size. Therefore such circumferences should be included in all anthropometrical schedules designed to investigate racial characters.

NOTES ON THE ANTHROPOLOGICAL MUSEUMS OF CENTRAL EUROPE¹

By GEGORE A. DORSEY

During the months of September and October of last year, I visited the countries of central Europe for the purpose of examining the more important anthropological museums. The object of my visit to these museums was twofold: (1) to study the anthropological collections with a view of ascertaining how far the museums of Europe represent the various fields of anthropology, and (2) to observe methods of installation, the mounting and preservation of specimens, the material and construction of cases, the construction and arrangement of museum buildings, etc.

(1) Within the territory covered, I found no single museum in which the great fields of anthropology are adequately represented: no museum in which man can be studied from the standpoint of somatology, ethnology, archeology, and ethnography. Many of the museums cover two or even three of these subdivisions, but very few of them make any pretense of representing more than two. Beginning with the first subdivision of anthropology, namely, somatology, I found no museum which seems to undertake to exhibit man as an animal. In London, in the Department of Natural History of the British Museum, a beginning has been made to represent the physical features of the different races of men, but the scheme, as outlined to me by Dr Lydecker, provides for the exposition of only a limited series of skulls together with busts and a few skeletons of the five physical divisions of mankind, each group being provided with a good general descriptive label, and each skull with an individual label.

¹ Extracted from a report to the Director of the Field Columbian Museum.

While this is a direct advance, the scheme is so limited that the races can be but very superficially represented. To illustrate the limits of the proposed exhibit, in speaking of the subject of exchanges, I was told that American skeletons were not desired, inasmuch as there would be no place for them in the general scheme, but that the museum would be very glad to secure American crania.

In the Hunterian Museum of the Royal College of Surgeons in London, there is probably the largest collection of race skulls and skeletons to be found in any museum in England. The material is grouped by geographic areas, for which only general case labels are provided; but the individual specimens of the different tribes within these broad areas are not labeled, so that they are not readily available for study. In addition to the ethnic osteology in this museum, there is a very interesting series of bones illustrating the normal range of variation in the skeleton of man. This series, although the best seen in Europe, is not nearly so complete, comprehensive, or well labeled as the series in the gallery of Physical Anthropology of the Field Columbian Museum.

In the Natural History Museum in the Jardin des Plantes, Paris, there is another very extensive and valuable collection of osteological material representing many races. This collection has recently been rearranged in a handsome new building, and presents a very attractive appearance; the material is excellently mounted, well labeled, and is supplemented by valuable maps and a full series of photographs of the different peoples represented. There is also in this museum a small series illustrating the range of variation in the human skeleton.

Still another collection of osteological material was seen in the museum of the School of Anthropology at Paris, sometimes called Broca's Museum. It is housed in the attic of an old building, and most of the specimens are so covered with dust that it is impossible to determine whether they are labeled or not.

Two other collections devoted to somatology were examined, one in the Natural History Museum at Vienna, and the other in the Ethnographical Museum of Berlin, the latter being the property of the Anthropological Society of that city. Neither of these collections is accessible to the public, and owing to imperfect labeling and lack of data in connection with the individual specimens, they are not readily available to the general student. By reason of the absence of Professor Virchow, I was not permitted to see the very large and valuable collection of crania in the Pathological Institute.

Ethnology, the second great division of anthropology, is fully represented in but one museum, namely, the Ethnological Museum of Oxford. In other museums, both in England and on the continent, may be seen series in which certain phases of man's development are shown, but the Oxford museum alone is devoted completely and entirely to an exposition of the history of culture. It is next to impossible to study in this museum the arts and industries of any given race or people, but it is possible to study here as nowhere else the development of any one of man's many lines of industry. The scope of the museum may best be shown by quoting a few of the case-labels: Fire-making; Mortuary customs; Animal forms in savage art; Defensive armor and helmets; Primitive food and water vessels, substitutes for pottery; Ancient wheel-made pottery; Bark-cloth making; Primitive light-appliances; String-making; Development of writing; Toilet-appliances; Bronze-casting; Deformation of ears, lips, etc. This idea of grouping all objects by classification based on use or purpose instead of by races, it will be remembered, was for a long time the scheme of exhibition in vogue at the United States National Museum, but recently that plan of classification has been abandoned to a large extent, and the museum has been rearranged on an ethnographical basis. I cannot but think that a great deal of extremely valuable material in the Oxford museum, which would throw light on the various races of the

earth, is lost to sight in these developmental and evolutionary series, and it is a question whether or not a great deal of time and material has been diverted in the attempt to show what as yet is but very imperfectly understood. A few series similar to those of the Oxford museum, such as fire-making, bark-cloth making, musical instruments, etc., are undoubtedly of the utmost importance in their suggestiveness to the average museum visitor; but it should be the object of the present generation of museum men to collect material from the different races of the earth, and to classify and exhibit it as such. Later, whenever any of these so-called evolutionary series may become desirable, the material being already at hand, it will be a matter of but little difficulty to select and mount the specimens. Before leaving this subject, however, I gladly acknowledge the fact that the Oxford museum is one of the most fascinating I have ever visited. The various series are so complete, so well selected, and so well labeled, that each case of objects attracts one's careful attention. I was impressed by the thought of the pleasure and satisfaction it would give one to read the delightful pages of Tylor's *Early History of Mankind or Primitive Culture* with the contents of this museum before him as illustrations.

The third division of anthropology, namely, archeology, or the study of mankind from the relics which he has left behind in prehistoric times, is well represented in several museums. The subject is especially well illustrated in two museums, but this is perhaps due to the fact that in these but little attention is paid to the other branches of anthropology. The Blackmore Museum of Salisbury contains one of the best selected and arranged collections of man's prehistoric relics that I have ever seen. Many other museums may possess much larger numbers of specimens from certain regions, but here it is possible to study the archeology of man in nearly every quarter of the globe. The Blackmore Museum is of special interest to Americans, inasmuch as it contains the collections made by Squier and Davis in the Ohio

mounds nearly fifty years ago. At Zurich, in one section of the National Museum, is the second best arranged and best exhibited archeological collection that it was my good fortune to see. This collection is especially rich in, and indeed is almost entirely devoted to, collections from early Roman times and from the Swiss lakes. This latter collection is easily the superior of all others in value to be found in Switzerland. It possesses also an historical interest, as it is the collection upon which Keller based the observations recorded in his valuable work on *Lake Dwellings in Switzerland*.

The importance of archeological collections in other museums visited was more or less obscured by the extensive and valuable ethnological exhibits. In London one must visit two museums at least to gain an idea of the character of early man in Britain. For the very early or so-called paleolithic period, one must visit the Natural History Museum in Cromwell road, where the collections are extensive, well arranged, and as a rule well labeled. In the British Museum there is a large collection of objects covering in a general way the entire archeological field. This collection is especially valuable for England and northern Europe. The Ohio and Mississippi valleys are fairly well represented, but the collections are not fully labeled. In the Natural History Museum at the Jardin des Plantes is also a very good archeological collection, especially rich, as might be expected, in objects from France. The museum at Saint-Germain-en-Laye, which I am informed is one of the best arranged and most complete archeological museums in Europe, I was unfortunately not able to visit.

The collections of prehistoric objects in Vienna fill several well-lighted rooms, are most admirably arranged and labeled, and present a very attractive appearance. Vienna is fortunately situated, for the neighboring countries abound in mounds which have yielded some of the most interesting bronze, copper, and stone implements that have ever been found in any country.

The collection in Berlin is also very extensive, but is neither so well arranged nor labeled as that of the Vienna museum. It is of course especially rich in relics from northern Germany and the neighboring provinces. Here also is to be found the Schliemann collection from Asia Minor, of the greatest interest and value. In Hamburg there is a very good series of stone relics from the province of Schleswig-Holstein.

Naturally the fourth division of anthropology, namely, ethnography, which treats of the different races of men, occupies the greatest amount of space in the majority of European museums. The ethnographic collections in both London and Paris are disappointing. The large hall devoted to this subject in the British Museum is not well adapted to the purpose for which it is used; it is rather inaccessible, poorly lighted, and does not admit of ready scientific classification of the objects therein deposited. Naturally this hall contains many of the rarest and most valuable objects that have ever been obtained by any museum in the world; but owing to causes already mentioned, and to the crowding of the cases, it is practically impossible for the visitor in a short time to form any idea of the value of the collection. There are many rare and unique specimens, but the collection as a whole cannot be regarded as well illustrating the various fields of ethnography. Many of the objects exhibited are, I believe, the property of the London Missionary Society. It is to be regretted that the capital of a nation which embraces in its domain so many and such diverse peoples, should not possess a museum which shows the ethnic characteristics of some of these peoples in an adequate manner.

In Paris the confusion is, if anything, worse than in London. In the Louvre, in the so-called *Musée de la Marine*, are many valuable specimens gathered from various parts of the world, but they seem to be regarded merely as "curiosities," and many of them are used as wall decorations. As a scientific ethnological collection it is a failure. The collection in the *Ethnographical*

Museum in the Trocadero is very extensive, and as regards a few races is fairly complete and important. But the Trocadero is not adapted to museum purposes; it is poorly lighted, and does not seem to be clean, while the cases are the poorest of any museum visited in Europe. There is also an ethnographical collection in the Artillery Museum of the Hôtel des Invalides. Here are many valuable implements, weapons, and pieces of armor from different parts of the world, but they, too, are treated as mere curiosities and are neither well labeled nor well mounted. In this museum there is a series of about forty plaster figures representing many races of men, each dressed in costume; very few, if any, of these were made from life casts, but were sculptured from photographs and measurements. While presenting a rather attractive and interesting appearance, they are of little value for scientific study.

The ethnographical collections of Vienna, although not nearly so extensive as the archeological exhibits, are of pronounced value; they are scientifically classified, well arranged and cased, and carefully labeled. The collections from North America are meager, but many parts of South America, especially Brazil, are well represented. There are also good collections from the islands of the Pacific.

The Museum für Völkerkunde, in Berlin, certainly contains the largest amount of ethnographical material to be found in any one museum in the world; in fact, I am inclined to believe that it possesses a greater number of specimens than any other two museums combined. There are few important areas on the earth from which it does not seem to have more or less complete collections. Probably it is weakest of all in North American ethnography. The great hindrance to study in this museum lies in the crowded condition of the cases. The plan of labeling and illustrating by means of photographs, and of supplementing labels with maps, charts, and diagrams, is most excellent; but on account of the rapidity with which objects have been received by the museum,

the curators have not always been able to follow this ideal scheme of installation, consequently many of the collections cannot be seen to advantage by the general visitor; indeed, a majority of the collections can leave only a feeling of confusion in the mind of even the most careful observer. This condition, however, is not the fault of Dr Bastian, nor of his able assistants, but is due to the fact that the museum building has long proved to be inadequate, and also to the rapidity with which the collections have increased.

The collection at Munich, while of importance to the specialist in certain fields, such as China and Japan, is not of sufficient interest to demand special consideration. It is housed in a building wholly unsuited to museum purposes; the collections are crowded, and do not seem to be well arranged or labeled. In Dresden, also, the building was not designed for use as a museum, but, considering the limited space, the objects are well arranged.

In Hamburg the space allotted to ethnography is inadequate for a proper exposition of the specimens. While a few regions are fairly well represented, and while the museum contains many priceless specimens, as a whole it ranks far below those of Berlin and Vienna. In Leyden there are very valuable and interesting collections from many parts of the globe, notably China, Japan, the Dutch possessions in the Pacific, and parts of Africa. The collections are divided among three unsubstantial, poorly-lighted buildings, and it is with great difficulty that one can make any satisfactory examination of them. It seems a pity that collections so valuable as these cannot be assembled in a single structure located either in Amsterdam or Rotterdam. Nevertheless, in spite of great difficulties in the way of a satisfactory examination of specimens, no student of ethnography can afford to neglect the Leyden museum.

Apart by itself, but worthy of special mention, is the Musée Guimet of Paris, which occupies a very handsome building devoted

entirely to collections of objects of a religious nature. This museum contains a very remarkable series of objects illustrating the great religions of India, China, and Japan, as well as a number of the minor religions of the world. The collections are well labeled, and for a small sum one can not only buy a complete catalogue of the museum, but may obtain handbooks which in themselves are valuable treatises on the various religions to which they are devoted. The museum as a whole presents a clean and inviting appearance, but the relation which many of its objects bear to religion is not apparent at first sight.

(2) Only four of the museum buildings visited seem to have been planned with a view to the purposes to which the buildings are now devoted. These are the British Museum (Natural History), the Natural History Museum of Paris, the museum at Vienna, and the Ethnographical Museum at Berlin. In only the Natural History Museum of London does there seem to have been made any provision for future expansion. Architecturally speaking, the museum of Vienna is one of the notable buildings of Europe, and its interior is entirely in keeping with its exterior. The building devoted to ethnography at Berlin cannot be termed handsome, but it is most admirably adapted for its purpose: unfortunately, however, it is at present utterly inadequate in size to permit a proper installation of its vast collections, and no provision has been made for its extension. There is no building in Europe, however, so admirably planned for museum purposes as that which has been so generously provided by the State of New York for the American Museum of Natural History. This building has been constructed on sensible principles: substantial, massive, fireproof, compact, of several stories which are easily accessible by means of large elevators; surrounded by a broad area, it is capable of great expansion, and is thoroughly adapted to and in keeping with the rich treasures it contains. The American Museum is also fortunate in having large, well lighted, and commodious quarters for storage and workrooms. In Vienna

also it was noted that ample provision had been made for the handling and assorting of extensive collections. Numerous work-rooms with abundant light are or should be an essential feature of every museum building.

The cases used for specimens in most of the European museums do not reach the standard of museum requirements of today. Except in the London Natural History Museum, and in Vienna, Berlin, and Dresden, no serious thought or care appears to have been bestowed on either the size and construction of the cases or the arrangement of the specimens. The actual installation of the specimens themselves seems to be much better in the Vienna museum than in any other which was visited.

The iron cases of Dresden and Berlin, of which we hear much, are rather ungainly, lacking in the beautiful finish which can be obtained in wooden cases. Furthermore, these iron cases are cumbersome, of enormous weight, and possess, so far as can be determined, no merit not possessed by the wooden cases of the South Kensington and Natural History museums of London. In Vienna there was seen a modification of the Berlin iron case, that is, a case with an iron frame enclosed in wooden panels. In case construction the great desideratum, of course, is to utilize a minimum amount of wood or iron, and to employ plates of glass of the largest practicable dimensions. Such a case should be as free from iron trimmings and locks as possible; in other words the case should obtrude itself upon the public as little as may be. Black seems to be the favorite color both for the inside and the outside of cases devoted to anthropological collections, and in the majority of museums visited either all or parts of the cases are ebonized.

Very few of the collections of European museums are adequately labeled, and in none of the museums, except perhaps the British Natural History Museum, is there any uniform system of labeling throughout the entire department. In most of the museums the labels are hand-printed. Many of the museums

recognize the value of general case labels, and these have been provided in nearly all the great museums. In a few museums, notably that of Berlin, the great value and importance of supplementing the labels by means of charts, diagrams, photographs, and maps have been fully recognized as above pointed out.

In no museum of Europe was there observed any serious attempt to reproduce types of the various races of the earth from actual life molds. In London, Paris, Vienna, and Berlin, representatives of a few of the races have been modeled in plaster from photographs. In the Bremen museum there are also several groups (not cast from life but sculptured from photographic data) which are very effectively mounted, two of the groups being of more than usual merit. Among the many groups at the Crystal Palace, London, are a few that seem unusually good and accurate. Nowhere in Europe have I seen work of this kind which equals that displayed in the museums of America.

In many of the European museums the hours for visitors are quite limited. In nearly all there is no admittance for the public on certain days, while in still other museums only parts of the exhibition halls are open daily, thus necessitating a visit extending over two or more days to examine the entire collection. Only in the Blackmore Museum is the entire collection catalogued, and this catalogue is almost a text-book of archeology, although it now needs revision. Especially to be commended also are the hand-books issued by the British Natural History Museum and the South Kensington Museum. Outside of Zurich and Vienna no catalogue worthy of the name was found among the continental museums. Of far greater importance than the general catalogue are the illustrated guides to special collections.

At several museums inquiry was made regarding methods of accessioning and cataloguing anthropologic collections, but nowhere was observed a system which seemed to possess any features that would enhance the value of that employed by the Field Columbian Museum. As this system has never been de-

scribed, brief reference to its salient points may prove of interest.

Every newly acquired collection, immediately upon its arrival, is assigned a number and given an "accession card." This card bears, in addition to a serial number, the name of the collector, the manner of acquisition of the collection by the museum, the place and date of the collection, the numbers assigned to the specimens, and a general statement of the nature of the collection. This card, together with any lists or correspondence that relate to the collection, are deposited in a stout envelope, made for the purpose, which also bears the name of the accession. This envelope forms part of the "historical file" of the department. Both accession card and envelope, together with all correspondence, are made out in duplicate, one set being retained in the office of the curator, the other being sent to the recorder's office. Each object in the collection is then numbered to correspond with the number on a card which bears the name of the object, with a drawing of the same if deemed necessary, the tribe or locality whence the specimen came, the name of the collector, and finally the location of the specimen in the museum—whether it be on exhibition, and, if so, where, or whether it has been placed in the temporary or exchange storage room. The information contained on the cards is next transferred to the department inventory books under the appropriate numbers. Each card, as well as each entry in the inventory, also bears the accession number. The cards are then collectively filed in a card cabinet under the accession number, each group of cards being provided with an index card. The collection is finally indexed in a single large volume under the name of the collector, the locality, and the tribe.

The advantages of this system are many and obvious. It can be determined at a glance what collections are in possession of the department from any locality or tribe in the world, as well as ascertained what collections the department may possess from

any individual as collector or donor or through purchase. From the accession number under any of these entries one can refer to the historical file for the lists or for the correspondence; or with the same accession number he may turn to the inventory book or to the card catalogue for a description or for the exact location of the specimens themselves. On the other hand, from the number of any given specimen, reference may be made at once to the inventory book for its locality or tribe; or, from the accession number there given, the correspondence in the historical file relating to the collection as a whole may be consulted.

SOCIOLOGY, OR THE SCIENCE OF INSTITUTIONS

BY J. W. POWELL

INTRODUCTION

An institution is a rule of conduct which men make by agreement or which is made for them by some authority which they recognize as such. Many, perhaps most, of these rules are of great antiquity and are observed as customs, but new rules or modifications of rules are instituted from time to time as the exigencies of society demand. Thus an institution is a recognized law of conduct devised by men. Law and institution are often synonymous terms. We use the term law from the standpoint of considering the rule; we use the term institution from the standpoint of considering the origin of the rule. I prefer to define sociology as the science of institutions rather than as the science of law, because in the term sociology I wish to include a study of the law itself and also to consider in what manner it originates and by what agency it is enforced, whether by sanctions of interest, sanctions of punishment, or sanctions of conscience. The term law itself has a wider significance than that in which I wish to use a term here. Law is a general term signifying not only the law of man, but the law of nature, and I wish to use it in this broad sense. I choose the term institution to designate the law made by man; but this term is often used with a broader signification than that which I desire—thus, an institution may be an organized body of men, or it may even be the name of a building. We sometimes call a well-known organization of men the Smithsonian Institution, and we sometimes call the building where they carry on their operations the Smithsonian Institution; but I here use the term institution to mean the rules of conduct in-

stituted by men for the regulation of society, and do not include the material things which they produce by their industry.

When we examine the subject-matter of any treatise on sociology we usually find it dealing with the laws of institutions by which conduct is governed, and with the attempt to enforce these laws by governmental, moral, customary, ceremonial, and fashionable sanction. I use the term sociology to distinguish one of five coördinate sciences: esthetology, technology, sociology, philology, and sophiology, and I call all of these sciences Demonomy.

I classify the sciences of sociology as *statistics*, *economics*, *civics*, *historics*, and *ethics*, and shall attempt to characterize them for the purpose only of setting forth their nature. I shall not extend the discussion into a treatise on the sciences of sociology severally, my purpose being classification only; for the end in view is to exhibit the logical necessity of making a pentalogic classification of all the sciences of demonomy in order that I may set forth the nature of qualities and how these qualities are founded on the universal properties of substances, having in view still another purpose, which is to classify and characterize the emotions. Pleasure, welfare, justice, expression, and opinion are concomitant; one cannot exist without the other, hence there can be no sociology without esthetology, technology, philology, and sophiology.

We must now explain why we put sociology third in the order of demotic sciences. In industries, we discuss natural forces under the rubric of mechanics, but we discuss only the forces not human—we consider only those of the environment of mankind, or those which exist in the air, water, rocks, plants, and the lower animals, and consider how they are developed from natural conditions by devices of control. In sociology, we consider human forces exhibited in activities which ultimately arise through metabolism, so that men control their own actions or conduct in obedience to their judgments of good and evil. Thus sociology

is the science of the control of human activities, not by mechanical devices as in mechanics, but by institutional devices. As the order of properties and qualities has already been established, and motion or force found to be third, sociology is consequently third in the demotic sciences.

STATISTICS

Statistics is the science of the enumeration of human beings and the material things which they produce. Here we have to consider what is meant by enumeration or counting. First, counting is determination of kind, then it is the determination of the number of the kind. Classification consists in the determination of the kind and in considering all of that kind in giving it a name; but enumeration consists in considering that series of a kind which is determined by some human purpose. A conventional series is always considered in conventional numbers, while the natural series or class is all of the kind.

Kind and form are concomitant, and thus forms may be counted, but usually such counting would lead to unwieldy, impracticable, or even inconceivable numbers; hence representative numbers are devised. The device used in reducing vast numbers to practical numbers is measurement. We do not count the grains of wheat, but we measure them in bushels. We do not count the blades of hay, but we measure hay in tons. We do not count the drops of molecules of wine, but we measure wine in gallons or by some other unit. Thus measurements are adapted to the state in which the article exists, as gaseous, fluid, or solid, and the units for the different states are made commensurate.

Animals may be counted without measurement, but they also may be measured; the method of measuring them is by weight. Other methods adopted in statistics for measuring forms is the measurement of spaces; but in weighing, forces are measured through the medium of gravity. This method of measuring does

not give units in terms of motion, but units in terms of one mode of motion, which is gravity; therefore the units are in terms of force. There are other units of measurements devised in the arts, as for example those for light, heat, steam, electricity, etc., but we will not consider them here.

The common units of measure are units of space or of gravity. Governments prescribe the units of measurement in the interest of justice, and the instruments of measurement are regulated by law and kept under government surveillance.

The unit for the measurement of values is of gold or silver, one or both; in the case of both, the ratio is established. These units of value are coined in pieces as forms, and the government stamp gives warrant to the correctness of the amount of metal which they contain. If the government guarantee also their relative value, questions of great importance arise and these create political policies. If the government coins only for itself, and purchases the metal which it coins, it matters not what the ratio may be. If it coins at a ratio which is not the market value of the metals, the more valuable metal at the ratio adopted will give value to the coins of the less valuable metal, and both classes of coins will circulate at the value established by law. If the mints of the government are free to coin both metals for the public, and the legal ratio differs from the market ratio, the metal of lesser ratio value only will be offered for coinage, and the coins of the metal of greater ratio value will be driven out of circulation. Thus, in considering measurement of values many questions arise which are supposed to bear on the prosperity of mankind and especially on the people of a nation.

But why are statistics collected? The statistics of population in the United States are collected as a government function either by the nation or by the state for the purpose of fixing the basis of representation. Membership in the national and state councils is apportioned on the basis of population. The statistics of population, therefore, under our form of government, are

necessary, for they are used as a basis for national and state legislation. School districts must have an enumeration of the children of school age who are to be provided with schooling facilities. The county must have an enumeration of the persons who require charity that it may provide for their assistance. If the state builds an asylum for the blind, it must have the number of the persons to be entertained therein. Statistics are required by all sorts of business enterprises in order that men may act with intelligence. Thus, a life insurance company bases its rates of insurance on tables of statistics which show the probable average duration of life from the age at which the insured persons severally applied. All intelligent action in business enterprise is dependent largely on accurate statistical information. This function of statistics we will designate as the function of information.

Statistics are compared for different conditions to exhibit important relations of social life as causes of good or evil effects. The comparison is made of numbers taken at different periods in the history of a people for the purpose of exhibiting the evolution of social conditions. This leads us to the consideration of statistics in verification.

So common is this use that it would not be a bad definition to say that statistics is the science of the verification of sociologic inferences. The statesman, whose vocation is the study of practical government, deals largely with statistics, and the sociologist, whose theme deals with the social structure and its functions, resorts to statistics for the verification of his doctrine. In this use of statistics the greatest care is necessary in order that unsound doctrines may not receive apparent confirmation.

We may assume that kinds are properly discriminated, that measures are reasonably accurate, that enumerations are well taken, and that comparisons are wisely made. There yet remains a large field in the use of figures in verification in which they may be perverted to the sustaining of fallacies. This is the large field in which they are habitually used to verify theories of social evo-

lution. Perhaps the most potent sources of such fallacies are the use of figures for comparatively short periods of time which do not admit of the elimination of transient causes, and the proneness of men to look at causes in the interest of parties, sects, and social classes, and to impute false causes to such social conditions as they may lament or admire. This brief discussion will perhaps suffice to set forth the elements of statistics, which must be considered as integral parts of the science. To understand statistics it is necessary to understand the science of kind, the science of measurement, the science of enumeration, the science of comparison, and the science of verification, as they are represented in the science of statistics.

Causes are multitudinous. Much of demotic invention is exercised for the purpose of discovering the particular cause most easily modifiable in the interest of human purposes. In the multitude of such devices the causes are examined in a multitude of ways by a multitude of people who naturally seek verification for their inferences as to the best methods of modifying causes. In sociology this verification is by statistics, and any arrangement of figures which appears to verify an hypothesis may easily be believed as the true or modifiable cause of the effects considered.

In all the field of human thought there is no region in which verification is more important than in sociology, nor is there any field in which pseudo-verification entails more misery on mankind. Men may claim to verify their speculations about motors, and arrive at conclusions in which perpetual motions are supposed to be involved in mechanical constructions; but only the deluded persons themselves who are engaged in such enterprises as inventors, promoters, or capitalists, are deceived. But when social inventions which are supposed to accomplish "perpetual justice" are adopted by men as bodies politic, calamity for the multitude is the result.

Statistics are collected by governments in all their units as

nations, states, counties, cities, townships or wards, and families.

Within the governmental organization there are many other bodies corporate, such as educational institutions, ecclesiastical institutions, and industrial institutions. Every body of people is interested in the statistics which pertain to its functions. These secondary institutions are hereafter to be classified.

We have thus found that the elements of statistics are *classification, mensuration, enumeration, information, and verification*.

ECONOMICS

When, on the frontier, a log house is to be built, the man who proposes its erection invites his neighbors to a house-raising. The logs cut from the surrounding forest are brought to accessible places around the cabin site, and a yoke of oxen is made to drag them one by one into position for use. Four logs are placed on rocks as a foundation; upon these logs others are placed by rolling them up on skids, and so log after log goes up and the house grows apace. That these operations may be conducted successfully, a man is needed to drive the oxen; then a man is needed at each corner of the structure to fit the logs together where they cross each other near the ends. On each side of the house skids are used upon which the logs are rolled. As a log goes up a man at each skid stands ready with a chock to hold it in place as it is moved up by intermittent advances, and the two men at the corners receive the log, manage the adjustment of its position, and with their axes fit the ends of one log into notches in another in such manner that the house is well tied together. The logs are usually too heavy to be handled by a few men, hence a number are necessary to put them up, especially after the house grows, when the logs must be lifted to a comparatively great height. Thus the pioneer who is building a house enlists the services of many men to enable him to accomplish that which he cannot do alone. When many men assist in the work, every one doing a like part, their mutual action is sometimes called "sol-

darity " in political economy. When they assist one another by doing unlike tasks, as do the men who are managing the skids, and the men who are fitting the logs at the corners, and the men who are driving the oxen, their method of coöperation is sometimes called "division of labor." Hence coöperation is accomplished as solidarity and as division of labor.

For the purpose of coöperation men unite in associations, sometimes only for temporary purpose, but often for a more permanent purpose. When such persons unite for an indefinite length of time, which may be for years or even for generations, the association is known by a fiction of legal expression as a "perpetual person," and hence it is often said of some corporations that they never die.

In sociology a corporation consists of a number of persons who associate themselves for a common purpose to secure solidarity and division of labor.

Incorporation has its reciprocal in organization. When we affirm that a body of men constitute a corporation, we imply that they are organized; if we affirm that they constitute an organization, we imply that they are incorporated. The same body of men constitute an incorporation if we consider the purpose of solidarity, or they constitute an organization if we consider the purpose of division of labor.

The body of a man is incorporated as a body: but the body itself is differentiated or specialized into organs, as the term is used in physical science; or its parts exhibit division of labor, as the term is used in social science. Thus three terms are used in the sciences to express the same concept—differentiation, specialization, and division of labor. In treating of sociology it would be better to use the term specialization of labor rather than division of labor, and the term integration of labor rather than solidarity of labor.

We must now show the distinction which must be made between social incorporation and organization, and physical incorporation and organization. In man the many organs are

incorporated into one body by mechanical or physical bonds. The man is composed of actually coherent parts, but a society is composed of individuals who do not physically cohere. They may be together at one moment but apart at another, and members of the social corporation may wander about at will independent of one another; they cohere only in purpose, that is, they have a common purpose which is that for which the body politic is incorporated. There is thus coherence in purpose, but not coherence in mechanical structure. Purpose is something which exists only in the mind. We may therefore say that social bodies are ideally incorporated, while natural bodies are physically incorporated.

Having noted that incorporation is integration, and that differentiation is specialization of parts, we have further to note that this organization and specialization is accomplished to control the conduct of the members of the incorporation in relation to the purposes for which the society is organized. This control of the conduct is control of the activities of the members; the control of the activities is the control of the motility of the members in bringing them together and in speaking at their deliberations, but the control of their motility is effected by controlling their judgments. The individual members, every one for himself, controls his motility, or, which is the same thing, his activity, by controlling the metabolism or affinity of his several members, so that pairs of muscles which are set in operation, one against the other, are made the one to contract and the other to relax. Thus, a physical control of the several persons who constitute a body corporate is ultimately resolved into the control of metabolism, which is the control of affinity. There is a physical control of the conduct of the members through appeal to their purposes, which may be resolved into the control of affinity of particles. With this introduction we are prepared to consider the science of economics.

Economics is sometimes called the science of wealth and its

distribution. More fully defined, it is the science which treats of the nature of property, the accumulation of property as wealth, the use of wealth as capital, the use of wealth as investment, and the use of wealth as endowment, together with the relations of property, wealth, capital, investment, and endowment to corporations.

There are thus five elements for consideration in economics. First, property; second, wealth; third, capital; fourth, investment; fifth, endowment, which give rise in every one to a group of corporations. The elements will be considered first.

Property.—We have seen that labor is human activity exercised for the purpose of producing welfare. In producing welfare industry produces property.

We have already shown that the wants of men are wants of pleasure, welfare, justice, expression, and wisdom. Then we have shown that the wants of men for pleasure are supplied by esthetic arts¹; we have also shown that the wants of men for welfare are supplied by industrial arts²; we are now attempting to show that the wants of men for justice are supplied by institutional arts; we shall hereafter show that the wants of men for expression are supplied by linguistic arts; and after that we shall show that the wants of men for wisdom are supplied by instructional arts.

In all these classes of arts something is produced for consumption, and we have already learned that the something produced does not immediately reach its entelic purpose, but may remain in a state of disuse until an event of production changes it in some manner so that it may reach its entelic consumption.

During all these stages it remains as property. This is true of the conditions of all property of whatever nature. Then there

¹ "Esthetology, or the Science of Activities Designed to give Pleasure" (*American Anthropologist*, N. S., January, 1899).

² "Technology, or the Science of Industries" (*American Anthropologist*, N. S., April, 1899).

is much property which requires a long time for its consumption; for example, houses may remain to be consumed by a generation or even a succession of generations, but the houses are originally produced from substances which men produce, and a house may not be wholly consumed by the domiciliary user without the production of intermittent repairs. Land is not produced by man from original substances; it is only improved by man that it may be rendered more useful through the production of improvements.

We are thus led to understand the nature of property itself. It is something which serves men's purposes and which remains for a time more or less ephemeral in the possession of individuals, or of corporations, or even of governments, and may be exchanged from one possessor to another at any time while it yet remains; and its continuance in time is ended by the entelic consumption, except in the case of land itself, which does not cease with the production of one crop, but continues for the production of others indefinitely as long as proper cultivation is continued.

Men create property by producing it through labor, but when produced to the entelic state it is consumed, yet it remains in stages of production and also in stages of consumption. In any of these stages it may be accumulated.

The foundation of property is primordial appropriation from nature through labor. The tribal man who appropriates fish from the sea constitutes it property, though it may be of an ephemeral nature. Still, while the food may be ephemeral, there may be appropriated other substances of longer value; thus, he may take whalebone, which remains a longer time as property; if he appropriates animals from the forest, their skins may be property much longer than their flesh. This appropriation from nature has been universal among mankind, and in its simplest form is always recognized as just.

But there come complications in the appropriation from nature which give rise to differences of opinion about the extent to which and conditions under which this appropriation may be

carried on. By civilized man land is thus appropriated; this is absolutely necessary that he may make it useful. As he appropriates it by labor, the labor on the soil first produces a single crop. The labor of appropriating the land perhaps does not obtain its full reward by the first crop, but the labor for the first crop enhances the value of the land for subsequent crops.

All the land of the United States has been thus appropriated from nature—at first by individuals under grants from European governments; but since the organization of the present government it has appropriated the land and has either sold it again to individuals or allowed them to appropriate it for themselves by homestead settlement. But in assuming the ownership of the land the general government has invariably recognized the prior titles to the land inhering in the aboriginal tribes, and has purchased it from them by treaties, paying for the land by grants of money. The total sum thus granted is more than three hundred millions of dollars. The title of the Indians to the land was a title which arose out of a quasi-appropriation of the same—not by improving the lands themselves, but by gathering from the land their food, clothing, and shelter; still, in some cases the natives cultivated patches of soil. But the ownership of the land by these seemingly imperfect processes was fully recognized by the government of the United States.

The title to the land obtained by appropriating it through the labor of improvement has always been recognized among modern civilized peoples. But there are other agencies which give the land value, not included in that produced by improvements. Land may have an ever increasing value given it by extraneous conditions sometimes equal to or even greater than the interest on the investment as purchase money. The interest on the purchase money may partly or wholly be paid by the sale of farm products. In whom should the increased value to the land inhere? Men are divided in their opinion about the just method of distributing these increments of value. Our purpose is not to

discuss such questions, but to point out the nature of the problems which are involved in the study of economics.

Wealth.—Here we have to note that the fundamental production of property is appropriation from nature by labor. The substance appropriated from nature becomes new property at every stage of production, as artifacts, powers, and goods. Forever the value of the property is increased.

Thus, property remains only as property which is consumed as it is obtained, but property becomes wealth as it is saved. Frugality is thus the foundation of wealth, though industry and enterprise may contribute. Frugality, industry, and enterprise may add to wealth, for wealth already accumulated may be used as capital to increase itself.

Capital.—Property, which has become wealth, may now be considered as capital. Wealth may be used as capital in the purchase of machinery and the appliances necessary to the use of machinery, in the purchase of material for further stages of production, and, finally, in the employment of labor to aid in the industry of production. We have thus considered capital in its use in manufacturing. In the same manner we may consider it in its use in commerce. These cases are sufficient, perhaps, to illustrate the principle.

Investment.—Capital may be invested in such manner as to produce more without the owner of the capital engaging in commerce or manufacturing or in any of the industries of substantiation which we have heretofore considered. But as capital is of value in all of these industries, and as it may be invested with others who wish to conduct them, the interest on the capital may go to the owner of the capital. Thus capital becomes investment. That which in one stage we call property, in another stage wealth, and in another stage capital, we here call investment, meaning by that pure investment for interest.

Endowment.—And yet we are to see property and wealth and capital and investment assume a fifth form; this is endowment.

Men are not all chiefly interested in the pursuit of physical welfare, and those most deeply interested have other purposes which they hold dear. For this purpose the farmer may still be interested in his church and may be glad to endow his church; the manufacturer may still be interested in a library and be glad to endow a library; the merchant may still be interested in a college and may be glad to endow a college. So some wealth at last becomes endowment.

We have different stages of the same thing, and call these stages, severally, (1) property, (2) wealth, (3) capital, (4) investment, and (5) endowment. It would be convenient if we had a generic term to express these things. Let us call them all possessions.

In the terminology of jurisprudence the word possession is somewhat ambiguous when it is used to denote a holding as something distinct from ownership. Thus, a horse may be said to be in the possession of a man who has the right to use it because he has hired it, and its more permanent ownership may be in another man. The man who has hired the horse has a right to its use during the time for which it is hired, but the ownership of the property is said to still remain in the man from whom it is hired. Still further, a thief is said to be found in possession of property when it is discovered in his custody, but the possession is fraudulent or criminal. Taking the term in all its uses, possession seems to be the best generic term to signify property, wealth, capital, investment, and endowment. Here we need terms for a genus and its species, and select the terms as shown.

It is the nature of property to be consumed, and it becomes property only because it can be consumed; but ultimate consumption may be postponed, and often consumption requires time. In the same manner it requires time for production, and in modern industry it often becomes necessary that the materials of nature should undergo successive stages of production in different hands; so property exists in stages of production and in

stages of consumption. Entelic consumption is forever in progress, and what it produced is finally consumed. Wealth is that which remains over and above relatively immediate consumption. Capital is that part of wealth which is used by its owners in gaining other wealth. Investment is that part of capital which is used by its owners in gaining other wealth as interest, while the capital itself is in other hands in order that it may produce property for these others. Endowment is that part of investment which is dedicated to perpetual purposes, which the endowers believe to be important to mankind and from which they do not expect gain for themselves. We call all of these things possessions.

CORPORATIONS

The several forms of possession which we have described lead severally to forms of corporations. We have already defined corporations and shown how a body of men may be incorporated by organizing for a purpose.

Assisting Corporations.—That form of possession which we have called property, in which the possession is held by the owner for consumption, gives rise to a class of corporations which we will call assisting corporations. They are necessarily temporary in their nature, but they are often organized. A group of forest men unite to make a circle hunt of deer, or a driving-hunt of mountain sheep. Such a corporation would belong to this class. The instance to which we have already alluded of the men united to build a log house would be another example. In frontier countries the men of a community often unite to build a bridge across a stream, or they unite to work the roads, or they unite to burn the grass-lands that they may be more valuable for the production of natural hay. These instances will suffice to set forth the nature of what we call assisting corporations.

Partnership Corporations.—Two or more men unite by forming a partnership to carry on a business together. They com-

bine their limited wealth together with their common labor. Perhaps they employ assistance, but such assistance is ancillary to the object of the corporation. No further description is needed to set forth the nature of partnership corporations.

Creative Corporations.—The third class of corporations we shall call creative corporations. Here capital in larger quantities is organized, and the company to operate the enterprise is organized, and the employees or laborers are organized, every one to accomplish some particular part of the work. It may be that a factory is built for the purpose of manufacturing shoes; in it there are many machines, each operated by a special expert, and all the operations are supervised by a foreman, or there may be a foreman and his assistant foreman. Modern industries present many illustrations of these creative corporations. First, there is an organization of capital; second, there is an organization of machinery; and, third, there is an organization of labor. This complicated organization I call a creative corporation.

Creative organizations have the effect to instigate the laborers to organize societies which are known as trade unions, of which something more hereafter. When employers organize, employees organize. Thus power offsets power.

Investing Corporations.—We have seen how capital becomes investment. Investment is for interest. But there comes at last a stage in which the investors themselves organize as stock companies, not for the purpose of operating industries, but solely for the purpose of investing, while other corporations carry on the operations. These I call investing corporations. They might, perhaps, just as well be called stock corporations.

Societies.—We next come to that class of corporations to which endowments pertain; these are usually called societies.

CORPORATIONS SUB-CLASSIFIED

It is manifest that each group of corporations which we have hitherto defined may be classified by the pentalogic qualities as

those designed for pleasure, those designed for welfare, those designed for justice, those designed for expression, and those designed for instruction. Yet, if we were writing a treatise on political economy it would be necessary to deal severally with assisting corporations, partnership corporations, creative corporations, investing corporations, and society corporations, for in every one of these classes there are principles of justice which specially pertain to the class. Thus, assisting corporations often assemble on the invitation of the person to be assisted, and whether the invitation be heeded is wholly voluntary with the individual invited, and yet custom is almost as imperative as statutory law. Then there are special principles of jurisprudence which pertain to partnership corporations, which affect the responsibility of the parties to others, and the mutual ownership of the incorporators. In creative corporations the employees are more thoroughly differentiated from the proprietors, and the employees themselves are apt to organize trade unions, and the employers as corporations negotiate with the trade unions in important particulars. Again, in investing corporations the stockholders constitute a special body themselves, the members of which may not take a personal part in the creative corporations, although the members of the creative corporation may sometimes hold stock in the investing corporation. In these corporations the employees all receive salaries, but some are known as officers and others as laborers. In society corporations the purpose is usually to promote some desired end, the interest in which will continue for time indefinitely, as when schools are endowed or churches built. For present purposes we need not take up the classes of corporations seriatim, but indicate only their classification by qualities.

Corporations for Pleasure.—A number of schoolboys wish to play ball. Two leaders are chosen, and each one selects his helpers and assigns to each a particular part in the game; he thus organizes a baseball nine, which is a corporation for pleasure.

Nine men, with an additional number as alternates, are organized under a manager and play a game, not for the pleasure of themselves but for the pleasure of others, and receive from the others payment as a reward. The players may also take pleasure in the game, but their ultimate purpose is gain or welfare, so that it is welfare to the players and pleasure to the lookers-on. Whether considered as a pleasure or welfare, provision must be made for rendering justice when disputes arise, and hence there is an umpire. Now, the persons assembled to witness the game take great delight in the expression of skill manifested by the players. Their delight is not in the activity of play, but in the skill of those engaged in the play. At every moment as the play proceeds the players must use judgment, and their success depends as much on their judgment as on the skill with which they express it. The observers also exercise their judgment, and have their opinions about the players and about the judgments of the umpire, and express these opinions in approbation or disapproval, and the crowd is boisterous with such expression. In this example we see that the five qualities are concomitant in the same game, but the controlling quality is pleasure, for pleasure is the purpose of the multitude who come to look on, and it is the purpose of the players to give them pleasure that they may have gain.

This illustration is used to set forth the nature of demotic qualities and how some quality becomes a leading motive in demotic activities, while all the other motives remain as ancillary purposes. Purposes cannot be dissevered from one another in concrete activities, but they may be considered separately; that is, qualities are concomitant.

It will be noticed that the players must be organized into a corporation, but the onlookers constitute but an aggregate of people, although they may be assembled in a dense crowd. They are not organized for a purpose, although they have the common purpose of pleasure.

Corporations for Welfare.—There are corporations to promote the industries of substantiation, such as farmers' clubs, organizations for agricultural fairs, stock-growers' associations, and mining associations. There are corporations for the industries of construction, such as corporations for manufacturing, or societies for the promotion of a special class of manufacturers, such as bicycle manufacturers, men engaged in manufacturing leather goods, men engaged in manufacturing iron and steel goods, etc. Not only do the capitalists themselves organize into societies, but the laborers organize into societies; these are usually trade unions; thus the carpenters are organized, and the locomotive engineers are organized, and all varieties of labor may be organized in like manner.

There are many corporations to promote the interest of merchants, which are partnerships to promote solidarity and societies to promote division of labor. There are corporations of publishers to promote common interest, especially in the gathering of news, the publication of which gives circulation to advertisements. I need not consider such corporations further, they are apparent on the suggestion.

Corporations for Justice.—All party organizations are designed to promote and secure justice. Individuals may have other purposes, as advancement in political life, but the body of people who are thus organized have justice for their purpose.

All ecclesiastical bodies are organized for the establishment and promotion of the principles of justice, but it is rather the higher principles, which are considered as ethical principles. There is another motive for ecclesiastical bodies, which is the wish to promote sound ethical principles, supposed to depend on the acceptance of sound theological doctrines. But whatever the theory of ethics may be, the ecclesiastical organization has for its purpose the control of human conduct as expressed in the principles of justice. We need but to mention these principles to see the verity of this statement. The principles or elements of

justice are peace, equity, equality, liberty, and charity, for which all courts as well as all ecclesiastical bodies are organized.

Corporations for the Promotion of Expression.—At first sight these incorporations may seem to be hopelessly involved with corporations which have knowledge for their purpose, but on more careful consideration it will be seen that schools, which perform the double function of organizations for knowledge and expression, are in practice clearly differentiated. Of course schools for expression cannot succeed without considering the knowledge to be expressed, nor can schools designed for the increase of knowledge succeed in their purpose without considering how knowledge may be expressed. In America this differentiation is well recognized by the common practice of calling the elementary schools "grammar schools." In these grammar schools the primary object is expression; the ancillary object is thought to be expressed. The purposes cannot be divorced, because expression and knowledge are concomitant; but we consider the primary object of the grammar schools to be expression. The teacher who supposes that he can teach language without teaching the nature of the knowledge to be expressed, will fail utterly. So that the teaching of language or expression resolves itself into the best method of expressing judgments and concepts, and before expression can be taught the nature of these judgments and concepts must be understood, that knowledge and habit of correct expression may be inculcated. The organizations which are designed to secure expression are therefore the common schools of the country, or, as they are often designated, the grammar schools of the country, including the modern organization of kindergartens.

High schools, colleges, and universities consider the knowledge obtained to be their purpose, yet they do not neglect expression; in fact, it is only of late years that knowledge has become their primary purpose, and expression but an ancillary purpose. Originally such schools were organized for the study of

the languages in which knowledge was buried, and their purpose seemed to be expression rather than knowledge.

Common schools are not the only corporations for expression; there are schools or clubs of oratory and many literary clubs whose function is to train in expression rather than to derive pleasure from literature.

Corporations for the Purpose of Obtaining Knowledge.—There are many corporations of this character, and to properly set them forth we must touch them with the wand of pentology. Classified in this manner, they become corporations for instruction in the knowledge relating to pleasure, welfare, justice, expression, and opinion. Thus fine-art schools are organized to promote a knowledge of the arts of pleasure, industrial schools to promote the arts of industry. We may pause here to note how the schools of industry are classified. (1) There are schools of substantiation, such as schools of agriculture and schools of mining; (2) there are schools of construction, such as schools of manual training; (3) there are schools of technology, which are schools of mechanics; (4) there are business schools, under various names, which are schools of training in commerce; finally, (5) there are medical schools. Returning to the principal series, we find schools of justice; these are known as law schools. Then there are schools of expression, as we have already shown; finally, there are schools whose purpose is knowledge; these are the high schools, colleges, and universities. In addition to these there are many corporations designed to promote knowledge.

After this consideration of the subject we are prepared to give a new definition to the science. Economics is the science of the relation of production to consumption through the mediation of corporations.

CIVICS

In characterizing the science of economics we have set forth the nature of possessions as exhibited in property, wealth, capital,

investment, and endowment; then we have set forth the nature of the corporations to which possessions give rise. Corporations are groups of men organized for a purpose. We have further set forth that these groups of men may be classified to correspond with the fundamental classification of the qualities. In demonstrating this subject the reader obtains a more or less clear concept of the way in which human interests are involved, and the relations which men sustain to one another. Forever we learn that the individual is compelled to consider the interest of others. Cultured man inherits from the brute condition extreme egoism which the development of the arts is forever correcting. It is thus that the many individuals are incorporated into societies and finally into nations where every man is compelled to consider other men as partakers of his interest because he cannot serve his own without first serving the purpose of his neighbor. This is the fundamental lesson taught by economics. Only a few men can obtain food for themselves—the vast majority must eat from other men's cribs. Only a few can wear clothing produced by themselves—the vast majority must wear the clothing produced by others. Only a few men can take shelter in domiciles built by themselves—the vast majority must live in homes produced by others. Every man is also dependent upon others for his existence, and in infancy is dependent upon others for his preservation, and he remains still dependent in old age. Passing beyond the primordial principles of welfare, we still find the individual depending upon others for his pleasure; we still find him dependent upon others for his language, for no man has ever invented a language, and the language used by one man would be the language of a fool. For his opinions every man is indebted to others. None of the opinions of mankind could exist today without culture, and culture implies that human knowledge is derived chiefly from others and that language is necessary thereto.

The act of a man to seek his own interests regardless of the interests of others is a crime. In specialized society men must

seek their own interests by promoting the interests of others. This is the law of political economy by which wealth is produced. Self-interest may blind men's eyes to their true relations to others in relation to property. The brutal self-seeking which is inherited must by some agency be thwarted, else others suffer and hence self suffers. Then, the passions of men blind their eyes, and their passions must be controlled.

By common agreement rules or laws for the government of conduct are established, and these established rules are enforced ultimately by punitive sanctions. As punitive sanctions become more and more certain, the resort to such sanctions becomes less and less necessary if some method is devised by which the contending parties may have their cases adjudged. This leads to the organization of government. Government is a scheme for providing an organization of the body politic which will lead to the settlement of disputes, with power to enforce judgment by punitive measures.

Civics is the science of government. Government is organized to promote and establish justice. There are five elements of justice, no one of which can be neglected if any other is secured and at the same time justice maintained. These elements are peace, equity, equality, liberty, and charity.

Peace.—The fundamental principle of justice is peace, and primeval governments are organized to secure peace. There can be no pleasure without peace, and infractions of peace produce the most intense pain.

Equity.—On further consideration primeval man learns that he cannot secure peace without exterminating the causes of infractions of peace. Every example of a disturbance of the peace is found to be the effect of some cause, and tribal man speedily reaches the conclusion that the causes which disturb the peace are the inequities which spring up in society. Perhaps men quarrel over the distribution of the spoils of the chase, perhaps they quarrel over their wives, but every infraction of the peace is seen

to be caused by some inequity, and the question is asked, "How can these inequities be removed?" So tribal men attempt their removal by instituting courts of justice that peace may be maintained between the members of the tribe. They further find themselves involved in disputes and wars with neighboring tribes, and they make it a rule, even in the most primitive society, that the tribe, not the individual, has the right to declare war, and this declaration must be made by the council of the people. After the council has decided upon war, individuals on their own initiative may make the war, but they cannot engage in such war without the tribal consent.

We have seen that the incorporation and organization of social bodies is not by fixed juxtaposition of parts, but by purposes. Here we have to note that the equity which is necessary to the continual existence of social bodies is not equivalence of parts, as that term is used in physical science, but it is the equity of conduct. Equity, then, is the demotic term for equivalence. One man paddles the boat and another kills the game, but the gain is shared; this is equity, or equivalence of rights. While one party is hunting, another party may be fishing; each party shares in the gains of the other; this is equity or equivalence of rights. Still another party may be engaged in defending the whole group; all share in the protection and all share in the food obtained; this is equity, or equivalence of rights.

Equality.—Peace can be secured only if justice is maintained. That justice may be maintained, the entire tribal council must be consulted when it is assembled as a court of justice. The fundamental requisite for a decision of the matter in such a council is the equality of the members who compose the organization. One man's opinion may weigh more than that of another; equality of opinion is absurd, but equality of voice or vote in the council is necessary. So primeval man discovers the principle of equality, and from the first organization of tribal society to the present time, human equality has been a principle of justice.

That which masks the principle of equality in the councils of early nations is the method which grows up in barbarism and becomes thoroughly established in early national society, that guilt or innocence can be established by supernatural methods, and the judgments of the council or tribal court should be controlled by supernatural agencies, such as by ordeal; and when at last a stage of society is reached in which the ruler of the people is also the high priest of its religion, then the principle of equality necessary to the establishment of justice is temporarily overthrown, for the man who can render supernatural judgment has supreme authority. The law of equality in demotic bodies is the law of equality to assert judgments.

Here we note that the equality is not that physical equality which is fundamentally expressed in science, as the law that action and reaction are equal, but it is the equality of opinions of justice in the tribal court which may be resolved into equality of purpose—one man's purpose in rendering judgment must be equal to another's purpose in rendering judgment. They must be equal because they have the common purpose in rendering a judgment.

We have noted how equality is masked or even overthrown when the ruler becomes a high priest. In modern society, as in the United States, when the authority of the priest is overthrown, equality is more or less masked, although it may exist. Here the body politic is a very large group of people occupying extended regions. The court is no longer the council and the court combined, but special individuals are selected to constitute courts, and individuals are selected to constitute councils. In these councils the members are chosen by equality of votes, and they become representatives of all the people. But the council itself may be composed of two bodies—a senate and a house of representatives. In the house of representatives the council is directly representative of the people by their votes; but the senate is representative of the people in the second degree—it is

representative of state legislatures which are representative of the people of the state.

Representative government requires a comparatively high degree of intelligence. Experience proves that an uncivilized people cannot properly understand the nature of representative government and cannot successfully take part in such government with equality of vote, for they desire to vote upon all measures themselves rather than for representatives to devise measures; they would return to the savage council rather than submit to the judgments of the representative assembly. In the history of the United States we have been confronted with this difficulty in the management of the savage and barbaric tribes who were found as indigenes. It has been found impossible to induce them to abandon tribal government and to take part in national government by representation. As they claimed the land by hereditary possession, and as civilized man claimed the right to use the lands for purposes and by methods which civilization demands, a conflict speedily arose between the aboriginal inhabitants and the arriving thousands from oriental lands. This conflict has continued to the present time.

Other nations having representative governments rule over subordinate peoples, who are not yet competent to take part in representative government, by the method of imperialism as it has come to be called. In such cases the subordinate peoples are governed by rulers appointed by the central government, and the people themselves are permitted to rule themselves by tribal government subject only to the central authority. The ways in which this is worked out in practical affairs are very diverse.

Liberty.—Tribal men having discovered something of the principles of peace, equity, and equality, soon learn an additional principle necessary to their establishment; this is the principle of liberty. Every man in the council who becomes the judge of the conduct of his neighbor must have liberty to express his judgment, whatever may be the judgment of others. When the

council considers questions of common action, such as the removal of the village, or a hunting or a fishing enterprise, everyone must have a vote in determining action, for all must take part in the enterprise. The humblest man in the tribe must have liberty to express his judgment and must not be subject to the dictation of other men; hence liberty is recognized even in primeval society as essential to justice.

The liberty which men claim in tribal society is liberty of personal activity and the denial that such activity can justly be coerced by others. This remains in all stages of society; but in tribal government it pertains only to the members of the tribe. Alien persons may become slaves, and their liberties are not held sacred—a subject which we will hereafter consider.

When the offices of priest and ruler are consolidated, the ruler becomes not only the judge, but he also becomes the arbitrary ruler—not as one having authority to execute the judgments of a council, but as one having authority to execute his own judgments, for he who can act by divine right and as the vicar of the deity must be obeyed.

Charity.—Still in primeval society men learn the nature of charity and incorporate that principle into the concept of judgment. Perhaps the principle of charity has a more lowly origin than in human society. It is fundamental in all animal life where the parent provides for its offspring. On the bisexual organization of animals it receives an additional impulse in the coöperation of male and female and in the sympathy and assistance which they render each other. The third principle of charity seems to spring up in human society when children render assistance to parents in their old age. In tribal society these three principles of charity are well recognized, and provision is always made in the law of custom which is enforced by the tribal council.

It remained for civilization to add two principles to the concept of charity. The first is individually acted upon by tribal men, but seems not to be enforced by legal tribunal: It is the

assistance which men render to one another in misfortune. In early civilization this took concrete form by the establishment of charitable agencies, by the institution of laws for their maintenance and support, either by social bodies corporate or by governmental bodies corporate. In that stage of society in which church and state are still under one head, while the fusion resulted in the temporary overflow of liberty it performed a royal deed for mankind by enlarging the concepts of charity.

The fifth principle of charity is the recognition that justice does not require punishment, but only remedy for the past and prevention for the future, and that man may not mete out vengeance. This is the crowning element of charity. The elements of charity may be stated as (1) care for the young, (2) assistance to companions, (3) provision for the aged, (4) help to the unfortunate, and (5) mercy to the criminals. We have now developed the concepts of justice and have designated them as peace, equity, equality, liberty, and charity.

THE DEPARTMENTS OF GOVERNMENT

The departments of government may be classified as constitutive, legislative, operative, executive, and judicative.

Constitutive Department.—A modern government may have a written constitution which sets forth the plan of government. Other nations have an habitual system of practice, modified from time to time as circumstances seem to demand, which is observed as the common law of the government; but I wish to use the term constitutive government as one of its departments coordinate with the others which I will set forth. I desire a term which will signify the manner in which the officers of the government in all its departments are selected, chosen, or appointed.

In many governments the officers are such by hereditary succession. In other governments, as in the United States, the officers are largely elected, though provision is made for appointment, even of certain important officers, while a large number of

minor offices are filled in this manner. The persons who have the appointing power are persons who are elected to their offices and thus represent the people in their acts of appointment. Here different degrees of representation may be observed.

We wish to have a term which will signify the method by which the officers of the government are selected and the rules by which such selection is accomplished, and for that purpose I adopt the term *constitutive government*. I hold that this department of government is coördinate with the others to be explicated.

A representative government is one in which the officers of government represent the people. The manner by which they become representative must be in harmony with the third principle of justice, which is equality. All persons who constitute the body politic, and who acknowledge the government as authoritative and seek its protection from unjust encroachment, should have an equal voice, expressed by a vote, in the choice of the representatives of the people who perform the functions of the government.

In tribal government every person has a voice in the council, and the council is also the court. The chief of the council has but one vote like the other members, but he is also the leader of the people as they proceed to carry out the decisions of the council. Such a method of government is impossible in modern civilization, where the people are many and scattered over a large region of country. So representative government is devised in which few persons, compared with the whole number of the people, become the officers of the government, or, as it is sometimes called, the government itself.

This is in harmony with that principle of evolution which is called *specialization*, in which the functions of society are parceled among the people, so that one class of people may do one class of things for all. The experience of mankind in the evolution of society has resulted in an ever increasing specialization of these functions.

In other departments of human activity the specialization is largely voluntary with the individual, and men become farmers, manufacturers, or tradesmen by their own will; but whether they become officers of the government or not, depends not upon their own will, but upon the will of others whom they are to represent. In a high stage of culture the right to choose rulers is held of paramount importance. This motive has led to the organization of representative government.

The impossibility of realizing primitive justice and primitive equality by primitive methods has been more and more clearly demonstrated with the ages of advancing civilization. The savage is willing to be controlled by the voice of the people of the tribe, with every one of whom he is acquainted, and with every one of whom he is related by bonds of consanguinity and affinity; but under the new conditions of society, where the individual man may not be acquainted with the man who produces his bread as a farmer, or produces his shoes as a manufacturer, but upon whom he depends for the supply of his wants, he finds it necessary to organize representative government. All men in the nation are neighbors of every man, and to maintain justice with these neighbors representative government is devised.

Here we are interested in the consideration of how governments shall be made representative. This is accomplished by some method of constituting a part of the members of the body politic the agents of justice, and those who select their representatives for this purpose are called their constituents. That department which I call constitutive government is the one that deals with the selection of the representatives of government in all departments.

Legislative Department.—This department of government is organized for the purpose of considering principles and determining the methods by which society should be governed. It therefore enacts statutes of law. The modern legislature or parliament is the differentiated organ for performing one of the functions

which was performed by the primeval council in primitive tribal society, while the other function, that of the court, is performed by another department of government. The relation between the constitutive department and the legislative department is pretty well recognized in the United States. We need not set forth the nature of the legislative department, as that is a subject upon which men in this country are well informed.

Operative Department.—The third department is pretty well recognized in all highly civilized countries, although it is but imperfectly differentiated from executive government. I mean by operative government that department which is undergoing rapid development and which is the subject of much controversy at the present time in this and other countries. It is affirmed by some and denied by others that the government should operate the railroads. Already the government, in one or another of its units, constructs the common highways, but beyond construction and maintenance further operation is unnecessary. City governments construct and maintain streets and sidewalks, and some of these subordinate units provide and maintain the agencies for lighting the city. Most city governments provide water for domestic use. The nation, the state, the city, the county, the township, or the precinct provides for the establishment and maintenance of schools. On every hand there is a development of the operative functions of government. The distinction which we here draw is well understood by the people, and parties are divided on the question of the wisdom of assuming operative functions by the government. On one hand extremists affirm that only executive functions should be exercised, and that all operative functions are encroachments upon the rights of individuals. On the other hand extremists affirm that all the operative functions of modern society should be assumed by the government in the interest of justice. This characterization of operative government seems to be all that is necessary for present purposes.

Executive Department.—The executive department is primarily organized for the purpose of causing the statutes to be enforced. It is charged with the maintenance of peace and order in society, both in its internal affairs and in its external relations. It therefore consists, in its personnel, of the executive officers of the government, as presidents, governors, mayors, marshals, constables, and policemen, and in external affairs with the army and navy with all their multifarious personnel. Nowhere among civilized governments is the differentiation between the executive and the operative departments fully accomplished, though the distinction is well recognized.

Judicative Department.—This department of government is pretty well segregated or differentiated from the other departments which we have indicated. Two distinct branches of the judicative department are well recognized, the one branch composed of justices of the courts, the other composed of the advocates or attorneys of the courts, who practise before the justices in guiding the procedure, in marshaling the evidence, and in calling attention to the law and the principles of law which they deem of importance in deciding cases. This side of the court is employed in the support of the interest of the disputants, both parties being represented in this manner, while the justices of the court preside over the hearing and, sometimes with the aid of ancillary juries, render a decision. While the legislature is engaged in the consideration of the principles of justice as applied to the people at large, the courts are engaged in the application of these principles to cases which arise in dispute.

Having set forth the nature of the five departments of government and explained how they may be perfectly recognized and yet imperfectly differentiated in practice, it seems desirable to make some further comment in relation to the importance of complete differentiation in these functions. The founders of the government of the United States were deeply imbued with the doctrine that the legislative, executive, and judicative depart-

ments should be thus differentiated, and it is often held as one of the crowning marks of their wisdom. When we consider the stage of differentiation of function which they found exhibited in the governments of the world, and consider their own accomplishment in this respect, it appears that a great advance was made in the interest of justice and the purification of political life. The fathers of the republic were confronted by the very general, though not universal, opinion of mankind, that a republican government would fall by inherent weakness: so they adopted measures in the interest of stability of government which were yet inconsistent with the principles which they avowed. Again, they had to meet and harmonize the interests of diverse colonies, and were compelled to adopt what has since been called the compromises of the constitution. For these two reasons some things were embodied in the constitution by its founders which their successors have deemed wise to change. Among these it may perhaps be claimed that they failed to differentiate the departments of government to such an extent as fully to carry out their principle, and the dream of representative government which we find depicted in the writings and speeches of the fathers of the republic has in part failed. But more: At that time the whole scheme of differentiation was but imperfectly understood. It may be that some radical work is needed, but the progress exhibited in the last decade of history gives warrant to the opinion that these changes may be made by evolution without revolution. It is now abundantly manifest that the government of the republic requires important changes in its methods of constitutive government. Its methods should be revised and its functions fully differentiated. On the other hand, the division between operative and executive government requires immediate consideration: conjointly they lead to corruption on the one hand and to injustice on the other. It is the opinion of the author that the great question in American politics today is to complete the differentiation of the departments of government.

A remark is here necessary. It is needful to discriminate between what I have here called the departments of government and the departments as they are known as offices of administration in the national union, as when we speak of the Treasury department, the War department, the Navy department, the Interior department, and the Department of Agriculture. These departments do not correspond to the departments of government as herein considered.

REGIMENTATION

Governments are organized into a hierarchy of bodies. These bodies are units of different orders. The people of the United States, with trivial exceptions which need not here be considered, are naturally constituted of families in which are involved duties and rights one to another. The families of a township or precinct or ward are organized into another body politic. Here we must note that town, precinct, or ward are names of units of the same order, although the different terms are used in different sections of the country and under different conditions. The families which constitute the townships are also organized into counties. Sometimes a city embraces more than one county, but usually the people of the city and the people of the county are identical. The families of townships and of counties are organized into states. Here we adopt American usage in the names of the subordinate units of the nation. The people of the states are organized into the nation which we call the United States of America. Wherever the English language is spoken this nation is known as the American nation. In considering this organization we must clearly conceive of its units as a hierarchy of subordinate units in the national unit, and that the nation is not something different in its personnel from the states, the state not something different in its personnel from the counties of which it is composed, the county not something different in its personnel from the townships of which it is composed, and the township not something different

from the families of which it is composed, but that the people are organized in this manner by the territorial grouping of their domiciles for the purpose of promoting and securing justice, and that part of the social relations of the people is regulated by the agencies of the nation, another part by the agencies of the state, another by the county, another by the township, and another by the family. Thus rights and duties are parceled out among the units of governmental organization.

Over those relations which the nation controls, its organs are of supreme authority, but it does not control those relations which are relegated to the state governments, nor do the states assume to control the relations relegated to the counties, nor do the counties assume to control the relations relegated to the townships, nor do the townships assume to control those relations relegated to the families. At one period the differentiation between national and state government may differ from the differentiation which prevails in another period; but when this differentiation is changed, it must be done by a change in the written constitution and submitted to the states severally for their ratification, in which case the constitutional majority must affirm, which is more than a plurality.

We have spoken of the organization of this nation as an example, but all other civilized nations have a corresponding organization which varies in differentiation of functions, but the same hierarchy of units is usually to be observed. In the same manner it is necessary to consider that the differentiation of the departments of government varies from nation to nation throughout the civilized world, while the principles of government which we have set forth as peace, equity, equality, liberty, and justice are differently expounded and applied to governmental affairs.

(The remainder of this article, which treats of Histories and Ethics, will appear in the October number.)

THE END OF THE NATCHEZ

By JAMES MOONEY

When LeMoyne d'Iberville sailed into the Mississippi in 1699, just two centuries ago, he found the Na'tsi or Natchez Indians, from whom the modern town takes its name, settled in nine villages, with a total population of perhaps 2500 persons, along what is now St Catherine creek, in Adams county, Mississippi. Thirty years later their villages had been destroyed, their chiefs and hundreds of their people killed or sold into slavery, and the survivors were fugitive refugees with other tribes. Today there may exist twenty of the name.

For several reasons a peculiar interest attaches to the Natchez. Their language seems to have had no connection with that of any other tribe, excepting possibly the neighboring Taensa of Louisiana. Their strongly centralized government and highly developed religious ceremonial gave them commanding influence among all the tribes of the region, while their heroic resistance to the French, and their final destruction as a nation, lend their history a tinge of romance which writers have been quick to appreciate. The interest is in no degree diminished when we learn that, contrary to the ordinary idea, they were not exterminated, but rather extirpated, which after all is but another word for the same process. Pénicaut, Dumont, Dupratz, and Gayarré, have told us of their religion, government, and primitive home-life. In this short sketch we shall endeavor to throw some light on their history subsequent to 1730, prefacing with a brief statement of the causes which led to their dispersal.

In 1699 the French under d'Iberville made their first permanent establishment on the gulf coast at Biloxi, Mississippi, eighty

miles eastward from the present New Orleans, which was founded in 1717, and became the capital of the new province of Louisiana a few years later. In 1716 the French governor sent an officer with goods to the Natchez to establish a trading post among them, but found already on the ground some English traders from Carolina who were trying to form the Natchez, Yazoo, and Chickasaw into a syndicate for the purpose of making slave-hunting raids upon the neighboring tribes, a business which the Carolina people had found extremely profitable in their late wars with the Apalachi and Tuskarora. The Englishmen were arrested and sent to Mobile, whereupon the Natchez killed several Frenchmen and seized their property. A force was sent to demand satisfaction, and the Natchez were compelled to deliver up several of their men to death and to consent to the erection of a French fort in their principal village.

With a garrison thus forcibly established in their very midst, the Natchez were soon in a condition of smothered revolt, a feeling which the English traders resident among the Chickasaw strove by every means to nurse into active rebellion. The French were well aware of these intrigues, and Adair, himself a British trader, says, that as the Natchez had "always kept a friendly intercourse with the Chikkasah, who never had any good will to the French, these soon understood their heart-burnings, and by the advice of the old English traders carried them white pipes and tobacco, in their own name and that of South Carolina, persuading them with earnestness and policy to cut off the French." He adds that the embassy succeeded in its purpose.¹ It is the old story of rival commercial nations using the native as a cat'spaw until he is finally crushed between the millstones.

In 1722 a quarrel occurred at the post, in which several were killed on both sides. The French commander attempted to punish the Indians by levying a fine upon the whole population of three villages, with the result that they retaliated, when the

¹ Adair, *History of the American Indians*, 1775, p. 353.

French burned one village and beheaded the chief. It is probably this circumstance to which Adair alludes when he says that the old men of the tribe had told him that the French had demanded "from every one of their warriors a dressed buckskin without any value for it," which made their hearts grow very cross, because they loved their deerskins.¹ The climax came in 1729, when the French commander coolly ordered them to abandon their principal village, that he might clear the ground for his own purposes. Engaging the Yazoo, Koroa, and Tioux to their support, and supplying themselves with arms and ammunition by means of a shrewd stratagem, at a given signal they fell upon the garrison on November 28, and massacred two hundred men—only about twenty escaping—besides capturing all the women, children, and negroes, with a loss to themselves of but twelve warriors. While the bloody work was going on, the Natchez chief was calmly seated under a shed giving directions for piling the severed heads in heaps about him as they were brought in.²

The war was now on. A smaller garrison was massacred by the Yazoo, boats descending the river were fired upon, the Koroa joined forces with the hostiles, and even the Choctaw grew restless. To terrorize the weaker tribes and to remove the imminent danger of an alliance between the Indians and the negro slaves, the governor at New Orleans compelled a party of negroes to massacre the entire small tribe of Chaouacha, and, later on, when some negroes who had fled to the hostiles were retaken, they were given over to the Choctaw to be burned. In January, 1730, a force of several hundred Choctaw, led by a French officer, attacked a Natchez stockade, killing eighty men, capturing eighteen women, and releasing a large number of captives taken at the first massacre. The next month a strong force, with field guns,

¹ Adair, *op. cit.*, p. 353.

² Charlevoix, *History and General Description of New France*. Shea's translation, 1872, VI, p. 83.

arrived and summoned another of the Natchez forts to surrender. The Indians twice rejected the summons with defiance and followed it up with a sortie, which was repulsed only after a hard fight. The whole body finally managed to escape across the river into Louisiana, the French finding it convenient not to intercept them. Says the historian, "The Natchez were not destroyed: they could in the future be regarded only as irreconcilable enemies."¹ Their allies, the Yazoo, Koroa, and Tioux, were less fortunate. According to the same contemporary historian, the French Indians fell on them and "made a perfect massacre: of the two former nations only fifteen Indians remained, who hastened to join the Natchez; the Tioux were all killed to a man." From later evidence, however, it appears that the destruction was not so complete as was at first thought.

Toward the end of the year it was learned that the Natchez and their allies, who were still a constant thorn in the flesh of the French, were stockaded in three forts in the neighborhood of Black river, Louisiana, and a force of seven hundred French, negroes, and Indians were sent against them. In January, 1731, the first fort, which Gatschet locates near the present town of Trinity, was invested. The chiefs having been taken by treachery, a part of their followers surrendered, but the others refused all offers, and when told that if they still held out no quarter would be given to man, woman, or child, they replied that "we might fire when we chose—that they did not fear death." On the night of the 15th, during a terrible rainstorm which obliged the French to keep under cover, they made their escape, to the number of about seventy warriors with their women and children, and when the besiegers entered the stockade they found only one man and a woman with a new-born babe. The French Indians refused to pursue them, and the expedition returned to New Orleans with their prisoners, being the principal chief or Sun, several sub-chiefs, forty warriors, and three hundred and eighty-seven women and

¹ Charlevoix, *op. cit.*, p. 101.

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children, all or most of whom were sold as slaves in the island of San Domingo.

Says Charlevoix:

The war was far from being finished. Le Sueur had ascertained from the Head Chief that the whole nation was not by any means in the fort that we had besieged; that it still comprised two hundred warriors including the Yazoos and the Corrois, and as many youth who could already in an emergency handle a musket; that one of their chiefs had gone to the Chickasaw with forty men and many women; that another, with sixty or seventy men, more than a hundred women, and a great number of children, was three days' journey from his fort, on the shore of a lake; that twenty men, ten women, and six negroes were at the Ouatchitas; that a band discovered by the army on the 18th of January comprised twenty men, fifty women, and many children; that some twenty warriors were prowling around their old village to cut off the Frenchmen; that the Yazoos and Corrois were in another fort three days' march from his; that all the rest had died of hardship or dysentery. We were finally informed that the Flour Chief might have assembled sixty or seventy men, a hundred women, and a great number of children.

This itemized statement would seem to give the Natchez 240 warriors, or perhaps a total of 1200 persons, still remaining, exclusive of the Yazoo and Koroa.

The survivors were desperate men, and the French historian continues: "We were not slow in perceiving that the Natchez could still render themselves formidable, and that the step of sending the Sun and all who had been taken with him to be sold as slaves in San Domingo, had rather exasperated than intimidated the remnant of that nation, in whom hatred and despair had transformed their natural pride and ferocity into a valor of which they were never deemed capable."

In June the Flour Chief with over one hundred warriors and their families, having come to the town of the Tonika, a tribe in the French interest, made a treacherous attack upon them, killing and wounding a large number, but losing thirty-six of his own warriors. About the same time some others, who had surren-

dered to the commander of the French fort built in their old country, seized some stacked muskets with which they fought until they were all killed, men, women, and children, to the number of thirty-seven. Another party of sixteen warriors, including a chief, having been captured and put in irons, broke their chains and were all killed while trying to escape. Finally, the scattered remnants, including probably also the Yazoo and Koroa, united under the Flour Chief, and in October, 1731, to the number of two hundred warriors, besieged the fort at Natchitoches, Louisiana, from which the French and their Indian allies were compelled to retire, until reënforced by a body of over four hundred Spanish and Indian allies from the west, when the Natchez in turn were obliged to retreat after a hard-fought battle in which they lost all their chiefs and about eighty warriors killed. This was the final blow. "So many losses, and especially the loss of their chiefs, reduced the Natchez to a mere tribal band; but there were enough left to harass the settlers of Louisiana and to interrupt trade."

From the first outbreak in 1729 to the final repulse at Natchitoches, two years later, we have a record of about 240 Natchez warriors killed and 40 warriors and about 400 women and children taken and sold into slavery, with no knowledge as to how many died of hunger and disease in the swamps or were picked off from time to time by the French Indians. It is safe to assume that not half the tribe remained alive, and they were homeless refugees. They could not return to their own country, for it was now in the hands of their enemies; neither could they seek an asylum among the Choctaw, Tonika, Attakapa, Caddo, Akansa, or Illinois, for all of those were in the French interest, while the smaller tribes that might have befriended them had been brought as low as themselves. They could go only to the tribes in the English interest, the Chickasaw, Creeks, and Cherokee, or to the English settlers themselves in Carolina.

As we have seen, a considerable body was already with the

Chickasaw, their old friends and instigators in the war, and it is probable that most of the others soon joined them. They seem to have found their new position insecure, as the Chickasaw were themselves hard pressed at this time by the French, and in 1736 a delegation of twenty-six "Natchee" Indians applied to the government of South Carolina for permission to settle their tribe on Savannah river. This seems to be their first appearance in Carolina history. Adair, the historian of the southern tribes, was at this time living among the Chickasaw. Their request was evidently granted, and they removed to the frontier of South Carolina, as did a portion of the Chickasaw at another time, on the persuasion of the English traders.¹ The "Natchee" are mentioned by Adair as one of the smaller tribes living with the Catawba in 1743, but retaining their distinct language. The next year the "Notchees," having killed some Catawba in a drunken quarrel, fled down to the white settlements to escape the vengeance of the injured tribe, and the colonial government was compelled to interfere to settle the affair. It is probable that the result of the quarrel was to separate them permanently from the Catawba, as in 1751 we find the "Notchees" again noted as one of the small tribes living in the South Carolina settlements. Soon after they seem to have moved up again and joined the Cherokee, for in 1755 they are twice mentioned as concerned with that tribe in the killing of some Indians near the coast settlements. This appears to be the last reference to them in the South Carolina records.²

Just here Cherokee tradition takes them up, under the name of *Aintsi*, abbreviated from *Ani-Ná'tsi*, the plural of *Ná'tsi*. From a chance coincidence with the word for pine-tree, *ná'tsi*, some English-speaking Indians have rendered this name as "Pine Indians." The Cherokee generally agree that the Natchez came

¹ Adair, *op. cit.*, p. 224.

² Mooney, *Siouan Tribes of the East* (Bulletin of the Bureau of Ethnology, 1894), pp. 83-84.

to them from the Creek country. It is probable that the first refugees came from South Carolina, while others say that they came from Carolina, and were joined later by others from the Creeks and Chickasaw. Some of them, we are told by Bienville, went directly from the Chickasaw. They seem to have been regarded by the Cherokee as a race of wizards and conjurers, probably due in part to their peculiar religious rites and in part to the interest which belonged to them as the remnant of a broken tribe.

The venerable James Wafford, a prominent mixed-blood Cherokee who was born in 1806 near the site of Clarkesville, Georgia, when it was all Indian country, and who afterward removed with his tribe to Indian Territory, informed the writer in 1890 that the "Notchees" had their town on the north bank of Hiwassee river, just above Peachtree creek, on the spot where a Baptist mission was established by the Rev. Evan Jones about 1820, and a few miles above the present Murphy, Cherokee county, North Carolina. On his mother's side he had himself a strain of Natchez blood. His grandmother had told him that when she was a young woman—say about 1755—she had occasion to go to this town on some business, which she was obliged to transact through an interpreter, as the Natchez had then been there so short a time that only one or two spoke any Cherokee. They were all in the one town, which the Cherokee called *Gwalgwá'hi*, "Frog place," but he was unable to say whether or not it had a townhouse. In 1824, as one of the census enumerators for the Cherokee Nation, he went over the same section and found the Natchez then living jointly with Cherokee in a town called *Gú'laníyí* at the junction of Brasstown and Gumlog creeks, tributary to Hiwassee river, some six miles southeast of their former location and close to the Georgia line. The removal may have been due to the recent establishment of the mission at the old place. It was a large settlement, about equally made up from the two tribes, but by this time the Natchez were indistinguishable in

dress or general appearance from the others, and nearly all spoke broken Cherokee, while still retaining their own language. As most of the Indians had come under Christian influence so far as to have quit dancing, there was no townhouse. Harry Smith, father of the late chief of the East Cherokee, and born about 1815, also remembers them as living on the Hiwassee and calling themselves *Ná tsi*.

From Gansé'ti, or Rattling-gourd, another mixed-blood Cherokee, who was born on Hiwassee river in 1820 and went west at the removal eighteen years later, it appears that in his time the Natchez were scattered among the Cherokee settlements along the upper part of that stream, extending down into Tennessee. They had then no separate townhouses. Some, at least, of them had come up from the Creeks, and spoke Creek and Cherokee as well as their own language, which he could not understand, although familiar with both the others. They were great dance leaders, which agrees with their traditional reputation for ceremonial and secret knowledge. They went west with the Cherokee at the final removal of the tribe to Indian Territory in 1838. In 1890 there were a considerable number on Illinois river a few miles south of Tahlequah, Cherokee Nation, several of them still speaking their own language, among whom were Groundhog, John Rogers, and a woman named Kehaka. Some of these may have come with the Creeks, as by an agreement between the Creeks and Cherokee, before the time of the removal, it had been arranged that citizens of either tribe living within the boundaries claimed by the other might remain without question if they so elected. Among the East Cherokee in North Carolina, about 1890, there were several who claimed Natchez descent, but only one of full Natchez blood, an old woman named Alkiní, who spoke with a drawling tone said to have been characteristic of that people, as older men remembered them years ago.

Haywood, the historian of Tennessee, says that a remnant of the Natchez lived within the present limits of the State as late

as 1750 and were even then numerous. He refers to those with the Cherokee, and tells a curious story which seems somehow to have escaped the notice of other writers. According to his statement, a portion of the Natchez, who had been parceled out as slaves among the French in the vicinity of their old homes after the downfall of their tribe, took advantage of the withdrawal of the troops to the north, in 1758, to rise and massacre their masters and make their escape to the neighboring tribes. On the return of the troops after the fall of Fort Duquesne they found the settlement at Natchez destroyed and their Indian slaves fled. Some time afterward a French deserter seeking an asylum among the Cherokee, having made his way to Great Island town, on Tennessee river, just below the mouth of the Tellico, was surprised to find there some of the same Natchez whom he had formerly driven as slaves. He lost no time in getting away from the place to find safer quarters among the mountain towns.¹ Notchy creek, a lower affluent of the Tellico, in Monroe county, Tennessee, evidently takes its name from these refugees. Haywood states also that, although incorporated with the Cherokee, the Natchez continued for a long time a separate tribe, not marrying or mixing with other tribes, and having their own chiefs, and holding their own councils, but their nation had now (1823) yielded to the canker of time and hardly anything was left but the name.²

We hear little of those who had taken refuge with the Chickasaw. Bienville, writing in 1742, says that, finding themselves an incumbrance to the Chickasaw, who were sorely pressed by the French, they had retired to the Cherokee.³ Haywood states that the Chickasaw received and protected them, refusing to give them up even on the demand of the French, and that some had remained with the Chickasaw ever since, while others

¹ Haywood, *Natural and Aboriginal History of Tennessee*, 1823, pp. 105-106.

² *Ibid.*, pp. 106-7.

³ Bienville in Gayarré, *Louisiana*, 1851, p. 325.

had joined the Creeks.¹ We may be sure that they took an active part in the wars which the Chickasaw waged with the French for nearly twenty years. On Bowen's Indian map of 1764 is found a town with the legend, "Remainder of the Natches," marked on the eastern bank of the Mississippi, about 34° 50', or northwest of the present Austin, Mississippi. The Chickasaw towns are placed somewhat to the southwest, while the present city of Natchez is shown as "Nautches."² Adair in 1775 speaks of "the Nanne Hamgeh old town inhabited by the Mississippi—Natchee Indians," in the westernmost part of the Chickasaw country.³ It is quite possible that investigation would discover some of the name still living with the Chickasaw nation in Indian Territory.

Those of the Natchez who joined the Creeks seem to have constituted the greater portion of the broken tribe. We have no exact knowledge as to when they first arrived, or by what route, but it is probable that they came by way of the Chickasaw after the persistent hostility of the French rendered the future of the latter tribe precarious. This is the statement of Milfort, who lived among the Creeks about 1780, and says that the Natchez were assigned lands on Coosa river, upon which they built the towns of Nauchee and Abicoochee.⁴ Adair says that the "Natchee Indians" constituted one town among the Creeks in 1775.⁵ They formed an important element of strength in the mixed confederacy of the Creeks, being estimated at 150 warriors in 1764,⁶ and again, with probably more correctness, at 50 to 100 warriors in 1799.⁷ By way of comparison it may be stated that Adair puts the Catawba at about 100 warriors in 1775. Swan, who visited the

¹ Haywood, *op. cit.*, p. 106.

² Bowen map, 1764, in Schoolcraft, *Indian Tribes*, 1855, v, at p. 252.

³ Adair, *History of the American Indians*, 1775, p. 195.

⁴ Milfort, quoted in Gatschet, *Creek Migration Legend*, 1884, p. 229.

⁵ Adair, *op. cit.*, p. 257.

⁶ Bouquet's estimate, 1764, in Jefferson, *Notes on Virginia*, 1802, p. 140 et passim.

⁷ Hawkins (1799) quoted in Gatschet, *Creek Migration Legend*, 1884, p. 139.

Creeks in 1791, speaks of the "Natchez villages" (plural) and says that "the Natchez, or Sunset Indians, from the Mississippi, joined the Creeks about fifty years since, after being driven out from Louisiana, and added considerably to their confederative body." At this time their chief, the Dog Warrior, was one of the most influential chiefs of the Creek confederacy.¹ Their town, Nauchee or Natchee, was on Natchee, now Tallahatchee creek, an affluent of Coosa river, about fifteen miles southwest of the present Talladega, in Talladega county, Alabama. Others were living in the neighboring Creek town of Abicoochee.² Being a warlike people they probably suffered their full share of loss in the Creek war of 1813-14, and when the Creeks finally sold their last remaining lands in Alabama in 1832 and removed to their present territory west of the Mississippi, the Natchez went with them, and the few survivors are now there, excepting such as have joined the Cherokee to the northward. From one of their principal men, John Lasley, of Abika, ten miles from Eufaula station in the Creek Nation, Gatschet obtained a valuable vocabulary of the old language in 1885. Under the laws of the Creek nation Lasley represented his tribe in the Creek "house of warriors," although practically without a constituency. He was still alive at an advanced age, together with several other relatives, all speaking their own language, when the writer visited Eufaula five years later.

Synonyms

NA'TSI—Nache, Nachee, Nachés, Nahchee, Naktche, Natchee, Natchez (old French plural), Nauchee, Notchees, Ani-Ná'tsi, Aníntsi, Pine Indians, Sunset Indians. The Indian word is of doubtful origin and etymology.

YA'ZU—Yasoux, Yassaues, Yassu, Yazoo.

KOROA—Coloa, Coroa, Corrois, Couroua, Kouroua, Kólwa, Kúlwa.

TIOU—Théloel (?), Thioux, Thysia, Thoucoue (?), Tihiou.

¹ Swan (1791) in Schoolcraft, *Indian Tribes*, 1855, v, pp. 260-263.

² Gatschet, *Creek Migration Legend*, 1884, pp. 125, 138.

THE ALÓSAKA CULT OF THE HOPI INDIANS¹

By J. WALTER FEWKES

INTRODUCTION

A little over ten years ago an Indian living near Keam's Canyon, Arizona, informed Mr T. V. Keam, who for several years had been making a collection of Hopi curiosities, that there were two idols in a cave near the ruins of the old pueblo of Awatobi. Mr Keam, supposing these images to be so ancient that they no longer were used in the Hopi ritual, especially as they were reported from a point ten miles from the nearest pueblo, visited the place, and brought the idols to his store, several miles distant. When the removal of these objects became known, it created great consternation among some of the Hopi, and a delegation of priests from one of their villages begged Mr Keam to restore the figurines to them, stating that they were still used in their ceremonies. This request was immediately granted, and the two idols were borne away with great reverence by the priests, who sprinkled a line of meal on the ground along the trail as they returned home. The images, however, have never been returned to their old shrine under the Awatobi mesa, but a new fane has been found for them, the situation of which is known to no white man.²

From the late Mr A. M. Stephen's rough sketches, notes, and measurements of these images (which the writer has not seen), it appears that they are made of cottonwood, the larger one about four feet tall, the other five inches shorter. Mr Stephen thought

¹ These studies were made under the auspices of the Bureau of American Ethnology.

² The author has been told that they were deposited among the foothills of the coffin-shaped mesa southwest of Awatobi.

that they represented male and female, and his sketches of them show ground for that belief. Each has a well carved head, from which arise two straight projections which will be spoken of as horns.

In his studies of the Hopi Indians the author has several times visited the shrine at Awatobi where these objects were once kept, finding it a depression in a large boulder, which was formerly walled up with masonry, making a shelf upon which the images stood. The entrance to this shrine faces the east, and the boulder lies a few feet lower down on the cliff than the foundation of the old mission church of San Bernardino de Awatobi. By interrogating Indians regarding the images, he has found that they represent beings called *Alósakas*, the cult of which, once practised at Awatobi, still survives in the rites of the modern Hopi pueblos. Many legends concerning *Alósaka* have been collected, but only during the last few years has the author witnessed ceremonies connected with their cult. As a result of these observations a suggestion in regard to its significance is offered.

The distinctive symbolic feature of these images is the horns (*dla*) above referred to, from which they take their name. There is a priesthood at Walpi called the *Aaltá* or Horn-men (to whom the name *Alósaka* is also given), who are the special guardians of the cult and who perform rites which throw light on its nature. These *Aaltá*, in their personifications of *Alósakas*, wear on their heads close-fitting wicker caps,¹ on which are mounted two large, artificial, curved projections made of buckskin, painted white, and resembling horns of the mountain sheep² which, in certain of their actions, the *Aaltá* imitate.

¹ See *Fifteenth Annual Report of the Bureau of American Ethnology*, plate cx.

² The mountain sheep or mountain "goat" was formerly abundant in the mountains which form the watershed between Gila and Little Colorado rivers, and Castañeda speaks of seeing and following them after leaving Chichilticalli, probably in the White mountains. This animal was no doubt well known to the clans who lived in the southern parts of Arizona, before they migrated northward, and worship of it was the original form of the *Alósaka* cult.

The three Walpi ceremonies in which we find survivals of the *Alósaka* cult are the Flute, the New-fire, and the Winter Solstice, which are especially instructive in a study of its significance.

PERSONATIONS OF *ALÓSAKA* AS ESCORTS

In the Flute and New-fire ceremonies the role of the personators of *Alósaka* is that of an escort who leads the columns of dancers or processions of priests.

The personation of *Alósaka* in the Walpi Flute-dance was by a member of the *Ása* clan, who, on the fifth day of the ceremony, drew a line of ground corn and made rain-cloud symbols along the path by which altar objects were carried from one place to another. He made a line of meal across the trail by which one enters Walpi, in order to symbolically close it to visitors on the seventh day, when the historic reception of the Flute chief by the Bear and Snake chiefs was dramatized, and brushed away this meal when the Flute chief was invited to enter the pueblo at that time. He also "closed" the trail a second time when the Flute priests marched into the pueblo, and brushed the meal away as they proceeded. On the last day he led a procession of priests to the Sun spring (*Tiwapa*), where a ceremony of wading into the water was performed, and escorted it back to Walpi on the afternoon of the last day, when the public Flute exercises were conducted. He sprinkled a line of meal over which certain sacred objects were carried from the Flute altar to the roof of the house, and led the priests as they bore these objects from place to place. There are only obscure hints regarding the nature of the *Alósaka* cult in these acts.

In the New-fire ceremonies we find *Alósaka* filling the role of escort, and also that of tyler at the kiva hatches. He escorted the public dancers, visited the trails, and drew lines of meal across them to prevent strangers from entering the pueblo. He inspected these trails from time to time, guarded the ladder while the new fire was being kindled, and carried it to the other kivas.

These duties are those of warriors, but *Alósaka* was not armed, nor is the mountain sheep which he represents a probable personation of a warrior.

It is interesting to note that there is no *Alósaka* escort of the Flute priests in their public dances at the Middle Mesa, and, judging from photographs, it would seem that there is a like absence at Oraibi, which may be due to the absence of certain clans. Thus, one of the chiefs of the *Aaltá* or *Alósaka* society at Walpi belongs to the *Asa* clan of Tanoan extraction limited to the East Mesa. The first colonists of this clan were essentially warriors, and their performance of escort duty may be a survival of former times.

As there are two chiefs of equal standing in the *Aaltá* priesthood, one of the *Asa* and the other of the Bear clan (one of the oldest in Walpi), it would seem that there are two phases of the cult, and that the function of *Alósaka* as an escort is distinct from an older one common to other Hopi villages.

GERMINATIVE ELEMENT IN THE ALÓSAKA CULT

The germinative element of the *Alósaka* cult, which we may regard as an ancient phase, was introduced into Awatobi and the other Hopi pueblos by a group of clans from the far south. These clans, called the *Patuñ*, or Squash, founded the pueblo of Miconinovi,¹ where the *Alósaka* cult is now vigorous, and were prominent in Awatobi where it was important. There is one episode of the elaborated New-fire ceremony which is traced to these southern clans; this concerns a figurine, called *Talatumsi*, kept in a shrine under the cliffs of Walpi and especially revered by the *Aaltá* or *Alósaka* priests.

In the elaborated New-fire rites, called the *Nadcnaiya*, just after the fire has been kindled by frictional methods in the *Moñkiva* before a man personating the Fire-god, one of the *Aaltá*

¹ They also founded the pueblo of Tcukubi, the ruins of which are still to be seen on the Middle Mesa.

brought into the pueblo, from the shrine in which it is kept, the image of *Talatumsi* wrapped in a white blanket with prayer-sticks in its girdle. This was set on the kiva hatches, one after another, where it remained several days; rites were performed about it, during which it was sprinkled with meal in prayer, and later reverentially carried by the *Aaltó* back to its shrine, where it was set in position to remain until the next quadrennial ceremony. This image is supposed to represent, not *Alósaka*, but the bride of *Alósaka*, the maternal parent of the *Aaltó* society about whom cluster so many folktales. She is the cultus heroine of that society,—one of their ancestors,—and her effigy is brought into the pueblo in November, every four years, by one of their number, just as we may suppose the images of *Alósaka* were brought into old Awatobi when the New-fire ceremony was celebrated in that ill-fated pueblo.

The Hopi have another shrine at which they worship in the New-fire ceremony, but instead of an image this contains a log of silicified wood called *Tuwapontumsi*, "Earth-altar-woman." Exactly who this personage is, the author has not yet discovered, but it is instructive to know that among the Hopi totems which he obtained, one of the men gave as his signature a figure of a lizard, a circle representing the earth, and a horned human figure which was called *Tuwapontumsi*. As this figure recalls that of *Alósaka*, and as the shrine of the being it represents is visited at the same time as that of *Talatumsi* by priests guided by *Alósaka*, it is not impossible that *Tuwapontumsi* is connected with the *Alósaka* cult.

A visit to this shrine was made by the two phallic societies, *Tataukyamó* and *Wúwútcimó*, directly after the kindling of the new fire in the chief kiva at Walpi. They were led by a man personating *Alósaka*, and after praying at the shrine they marched in single file to the site of Old Walpi, on the terrace below the present pueblo, and encircled the mounds of this old habitation four times, sprinkling prayer-meal as their leader, *Alósaka*, di-

rected. This place is called a *sipapá*, and below it are thought to dwell the ancients. The prayers were addressed to the old men who have died. "Down below us they dwell," said an old priest. "There the ancients dwell," said he, patting the ground with his foot. "We are now praying to them." There are many facts which show the existence of ancestor worship among the Hopi, but the author never heard it stated more clearly by the priests than the night he accompanied the phallic societies¹ to the ancient site of Walpi in the celebration of the New-fire ceremonies in November, 1898.

THE BIRD-MAN IN THE SOYÁLUŠA

One of the most striking features of the rites of the Winter Solstice ceremony in the chief kiva is the personation, before an altar, of a Bird-man who is thought to represent a solar god. This episode at Walpi has been elsewhere described,² but as at Oraibi it immediately precedes certain rites directly related to the *Alósaka* cult, a few notes on the personation of the Bird-man in the latter pueblo will be introduced.

About 10 P.M. on the day called *Tótokya*, the chief day of all great ceremonies, this man, preceded by two others, passed into the kiva, his entrance being announced by balls of meal thrown through the hatchway upon the floor, falling near the fireplace. The two men seated themselves, one on each side of the ladder, which was grasped in one arm. The Bird-man who followed had his face painted white, and in his mouth was a whistle with which he continually imitated the call of a bird, probably the eagle. He

¹ The two societies called the *Tatankyañti* and *Wuwuticimti* are termed phallic because they wear on their breasts, arms, and legs, figures of human phalli, and carry in their hands realistic representations of the external female organ of generation cut out of wood or watermelon rind. The former society was introduced from Awatobi by Tapolo, the chief of the Tobacco clan; the latter by the Squash clans, now extinct in Walpi. Both these clans originally came from the banks of Little Colorado river near Winslow; the Tobacco from Cakwalalyaki, now in ruins at the mouth of Cheylon Fork. See *Smithsonian Report* for 1896.

² See *American Anthropologist*, vol. XI, p. 20; also *American Anthropologist*, N. S., April, 1899.

first stood on the upraise in the floor, called the spectators' part, then squatted on the floor near the right pole of the ladder. He carried feathers in his hands,¹ and, moving his arms up and down, imitated the motion of wings, as if flapping them like a bird.

While he was performing these avian movements, the spectators sang a stirring song and the Bird-man slowly advanced to the middle of the room, imitating the gait of a bird and crouching in a squatting attitude. The motion of the wings and the bird-cries continued, the personator now and then raising his arms and letting them fall with a quivering motion. Once in the middle of the room he laid the feathers on the floor and remained there for a short time without moving. He then arose and danced for a long time, accompanied by a woman who held in one hand an ear of corn which she gracefully waved back and forth. She followed the Bird-man as he moved from place to place, and at the close of the dance took her seat near the right wall of the kiva where she sat before the Bird-man entered the room.

After the woman had taken her seat, the Bird-man continued the wing movements with his arms, stretching them at full length and then drawing them back to his body. He then proceeded to a pile of sand in a corner near the upraise; taking pointed sticks or reeds in his hand and halting before this mound of sand, he threw first one, then another, of the sticks into the sand, all the time imitating a bird in the movements of his body and simulating the bird-calls with a whistle. He then went to the *Soydluña* woman who had danced with him; squatting before her, he uttered the strange bird-calls, and, making a pass, raised the small sticks which he carried from her feet to her head several times. He then returned to the mound of sand and again shot the sticks into it, after which he returned to the woman. This was repeated several times. The bird personator then returned to the middle of the kiva, before the altar, and, taking a bow and some arrows, danced for some time, while all the assembled

¹ At Walpi he has a line of feathers tied along his arm.

priests sang in chorus. As the Bird-man danced, he raised the bow, fitted an arrow to it, faced the north, and drew the bow-string as if to shoot. This was repeated six times, the performer pointing the arrow to the cardinal directions in prescribed sinistral sequence.

At the close of this part of the performance the songs ceased and the Bird-man took a seat before the altar, while a priest at his right lit a conical pipe and blew through it, on the body of the Bird-man, clouds of tobacco smoke. This smoke was not taken into the mouth, but the smoker placed the larger end between his lips, and blew through the tube, causing the smoke to issue from a small hole at the pointed end.¹ After prayers by one or more of the priests, the Bird-man again danced before the altar, at the same time imitating the movements of wings with his arms and bird-calls with a whistle in his mouth. He then left the room and the calls could be heard as he went outside.

This proceeding is interpreted as a symbolic dramatization or representation of the fertilization of the earth, and is an example of highly complicated sympathetic magic by which nature powers of sky and earth are supposed to be influenced.² The Bird-man, called *Kwdtaka* or *Kwótaka*,³ is an old war-god, and possibly a sun god, the return of whom the Winter Solstice ceremony commemorates.

¹ A similar method of smoking has previously been described in an account of the sixteen songs sung by the Antelope priests in their kiva on each day of the Snake dance at Walpi.

² A pantomimic prayer or symbolic representation by which man shows his wishes to the gods by acting out what he desires instead of verbally petitioning them. This ceremony comes fairly within a definition of religious rites found in Tylor's *Primitive Culture* (p. 303): "In part they [religious rites] are expressions and symbolic performances, the dramatic utterance of religious thought, the gesture language of theology." The interpretation of savage rites as a sign language to the gods, and the relation of the altar to primitive ceremony have been ably discussed by Major Powell, to whom the writer is greatly indebted for a proper understanding of the significance of primitive altars. (See *American Anthropologist*, N. S., vol. 1, p. 26 et seq.)

³ The word *Kwótaka* admits of the following derivation: *Kwótka*, eagle; *tdka*, man, = Eagle-man; or, more probably, *Kwótka*, eagle; *tdpela*, the cross, symbol of the sky. This cross or four-pointed star appears on many ancient pictures of *Kwótaka*. (See *Smithsonian Report*, 1896, pl. xlviii.)

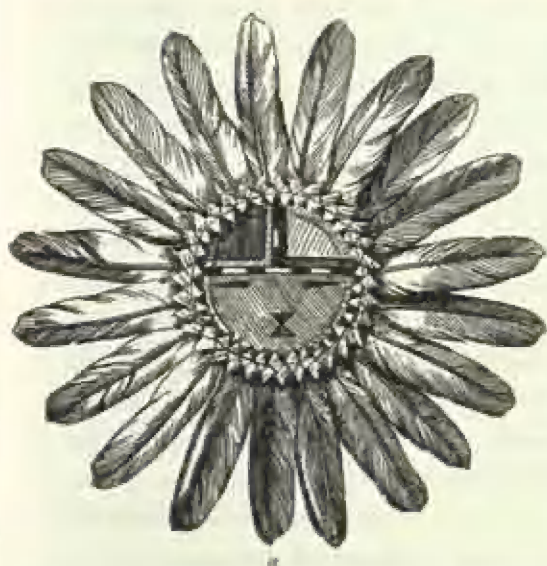
The evidence that the Bird-man personates a sun or sky god is derived mainly from morphological symbolism, and in support of the theory there are here introduced a figure of the most common Hopi sun symbol, also representations of dolls of a sun god, and *Kwdtaka* whom the Bird-man personates.

The common sun emblem (plate XXV, *a*) is a round disk with a woven corn-husk margin in which are inserted feathers of the eagle radiating at all angles. From the four quadrants project sticks—the ends of an equal-armed cross. This disk has the following design painted upon it: The upper part is separated from the lower by a horizontal line, and the space above is divided into two parts by a perpendicular line, while the mouth is represented in the lower space by an hourglass-shaped figure. Two marks represent eyes. This disk is worn on the backs of men personating the sun, in many rites, and is found painted on the screens used in the *Palulukonti* ceremony. It is the ordinary sun symbol in Hopi pictography.

Many conventional modifications of this symbol are common. The painted design is often omitted and the disk reduced to a circle, while the feathers are dropped, or concentrated in clusters in the four quadrants. In the sand picture of *Powalawá*¹ the sun symbol is made of concentric zones of sand of different colors with arrow-shaped extensions in the four quadrants. Again, the circle may be absent, when the four extensions in its quadrants remain, forming a cross called a *tokpela*. This highly conventionalized form of the sun is often found depicted on shields as a warrior's symbol.

Thus, while the equal-armed cross sometimes becomes a sun symbol, this by no means implies that the cross may not also have other meanings. The signification of symbols depends on association, and the simple emblem described may have an entirely different meaning in other associations. There is no more con-

¹ *Powalawá* is a part of the Oraibi *Powana* ceremony which has never been described.



HOPÍ SUN SYMBOLISM

a, Common Hopí sun symbol. b, "Big-head," a solar god. c, Kwátaka, bird with sun symbolism. d, Ahíhe.

stant decoration used in the ornamentation of ancient Hopi pottery than the cross, yet to interpret this simple figure as invariably a sun symbol would be absurd, for it may mean the sky, the four world-quarters, the four winds, the sun, or a star; or it may be employed simply as an insignificant decorative motive. Such simple designs as the cross, the circle, or the triangle, in primitive symbolism, may often be regarded as simply qualitative and are so used in pictography, their true meaning in specific cases depending on their association with other figures. In certain associations a circle is a sun symbol, in others an earth symbol; an equal-armed cross with a figure of a rapacious bird sometimes represents the sun, in other instances the four cardinal points, which, with the Hopi, are purely terrestrial directions or positions on the horizon.

Returning to the common symbol of the sun, or the disk with painted design and radiating peripheral eagle feathers, we find on comparing it with the symbolism of the head of a sun god (plate XXV, *b*), a close similarity. Among the features common to both are the markings on the upper half of the face, the radiating feathers, and the cross extensions. The marks on the sun disk, indicating eyes, are here replaced by balls, but of greater importance in future comparison, the mouth or double triangle is represented by a curving beak. The reason for the substitution of this form of mouth is apparent in a comparison with the head of the doll of *Kwótaka* (plate XXV, *c*), where a bird's head, wings, and tail are all represented. The symbolic design on the body of this bird doll is strictly comparable with those on the two sun symbols previously mentioned. The radiating feathers are replaced by tail and wings, while the head is suggested by the curved beak of the second symbol. A comparison of these three figures leads to the belief that they are three different sun symbols.

The fact that the last is called *Kwótaka*, and that the Bird-man in *Soyduña* was given the same name, supports the theory

that the latter is a solar god. In his performance he does not, to be sure, wear a mask with solar symbols, but he imitates a bird in action and voice. He is a patron of warriors, like the sun; he is the first god to return, and the *Soydluña* is a celebration to cause the sun to return. The eagle or a raptorial bird is the sun bird: the sun fertilizes the earth, and the ceremonial acts of the Bird-man at the Winter Solstice dramatize fertilization. In short, the conclusion to which studies of the ceremonial acts of the Bird-man, reinforced by those of comparative symbolism, have led me, is that the Bird-man personates the sun or a solar deity.

CEREMONY WITH THE ALÓSAKA SCREEN

After the bird personator had retired, a short interval elapsed, all the spectators of the previous rites remaining seated. A screen was then handed through the kiva hatchway and propped upright near the fireplace with blocks of clay and stones. This screen (plate XXVI) was estimated to be between four and five feet long, by about three feet wide, and was decorated on the side turned toward the fireplace and the raised floor of the kiva. The entire middle of the screen was occupied by a picture of *Alósaka*, identical with that on the sun-shield used in the Walpi *Soydluña*.¹ The head of this figure bore two curved horns, with two fan-shaped lateral attachments; the chin was painted black; in the right hand an ear of corn was represented, and in the left a *monkoku* or whitened slab of wood with attached feathers.

A triple rain-cloud symbol was depicted on the screen above the head of the *Alósaka* figure, and to the left were four parallel bars with a vertical row of four dots. In the lower left-hand corner there was a symbolic picture of the sun, and on the right side of *Alósaka* appeared an elongated figure which possibly may have represented a sprouting seed. To each side of the screen were attached four artificial flowers, and to the upper edge a number of hoops covered with raw cotton, possibly representing snow.

¹ *American Anthropologist*, vol. XI, 1898, pl. ii.



Drawn by Mary M. Leighton

SCREEN OF THE ALÓSAKA

A conventional symbol of corn was drawn on the lower part of the screen, and the surface was covered with various seeds, as corn, beans, etc., fastened with clay.

The rites performed before this screen were of a very simple nature, and one of the most important was the scraping of the seeds from the lower part into a tray after certain prayers and other observances. To the seeds in the basket was added a small quantity of raw cotton taken from the top of the screen, which was then carried out of the kiva.

The ceremony before the screen is interpreted as a prayer to *Alósaka* for rain, snow, fertilization of seed, and abundant harvests, symbolized by the figures on it and the rites performed before it. These ceremonies are very appropriately introduced in connection with those of the Rain-cloud people, since both came from the south and were brought by related clans.¹

CEREMONY WITH THE ALÓSAKA SHIELD

In the Walpi variant of the *Soydluña* or Winter Solstice ceremony, we have not as yet observed a ceremony with the *Alósaka* figure comparable with that with the screen just described; but there is a shield upon which is painted an almost identical figure of *Alósaka*.² The nature of the rites in which this shield is used is imperfectly known, and the character of the *Alósaka* worship in the pueblos of the Middle Mesa is yet to be investigated.

PICTURES OF ALÓSAKA

The symbolism of *Alósaka* is shown in a rude drawing made by one of the Hopi to illustrate a legend, and it represents this being on a rainbow, on which he is said to have traveled from his home in the San Francisco mountains to meet an Awatobi maid. Above the figure of *Alósaka* is represented the sun, which is drawn also on the screen above

¹ This relationship is yet to be determined at Oraibi, and the statement is derived from studies of the sociology of the East Mesa pueblos.

² *American Anthropologist*, vol. XI, 1898, p. 23.

described, for *Alósaka* is intimately associated with the sun, as are all the other horned gods, *Ahole*, *Calako*, *Tuñwup*, and the *Natackas*. An interesting detail of the symbolism of this picture of the sun is the crescents under the eyes, which are found also on dolls representing the mother of the gods, *Hahaiwüqti*, an Earth-goddess of first importance. The personators of *Alósaka* paint a white crescent under the left eye.

There is good authority for the belief that the conventional symbol of *Alósaka* is a profile view of a budding squash-blossom—a central bud and two lateral leaves. When this symbol becomes highly conventionalized, or made of rectangular instead of curved lines, it consists of a straight line with a triangle on each side, and is then the same symbol of generation that is painted with red iron oxide on the breast, arms, and thighs of the two phallic societies in the public New-fire ceremony.

As an idea of the nature of *Alósaka* may be discovered from morphological symbolism, let us examine the figures of a few of the horned "gods" in the Hopi Olympus.

The first group of horn-headed gods to which reference may be made are the pictures found on altars in the ceremonies called *Nimán* and *Powamá*. At Walpi these pictures are said to represent *Tuñwupkacina*,¹ a name which may be of Tanoan origin. Figures of *Tuñwup* have two lateral horns on the head, to the tips of which representations of feathers are sometimes appended. On the top of the head, between these two horns, there is represented a crest of radiating feathers, and on the forehead a broad-headed arrow which is sometimes modified to resemble the symbolism on the face of the figures of the sun painted on disks.

The *Tuñwup* type of horned gods includes the *Calako-taka*, *Natacka*, and one or two others. The mask of *Ahole*, who flogs the children during the *Powamá* celebration, has the same two lateral horns and representation of radiating feathers over the

¹ *Tuñ* (Tewa), sun; *wup* (Hopi), great = "great sun *kacina*."

crown of the head, but instead of sagittaform marks on the forehead there is a colored band from ear to ear across the face, as shown in plate XXVI, *d*.

It is probable that these horned gods have close kinship and are possibly identical, *Ahole* being simply a name of the personification by a masked man, and *Tuñwup* that of the picture of the same on the altar. The horned *Alósaka* does not belong to this type of horned "gods," although it has two horns on the head both in graven images and in pictures.

MYTHS OF ALÓSAKA

It will be seen from the preceding account that the *Alósaka* rites are well developed in the ceremonies of the New-fire and Winter Solstice, in which the clans from the south who joined the Hopi are well represented, or in which religious societies and ceremonial paraphernalia brought by the *Patuñ*, *Piba*, *Pátki*, and related clans have preëminence. Study of the *Alósaka* myths reveals an explanation of the meaning of this relationship.

During his valuable studies among the Hopi, the late A. M. Stephen obtained an *Alósaka* legend which is recorded in his notes on the Keam collection, and is here quoted with explanations obtained by the author since Mr Stephen's death.

"At the Red House in the south¹ internecine wars prevailed, and the two branches of the *Pátki*² people separated from the other Hopi and determined to return to the fatherland in the north.³ But these two branches were not on the best of terms, and they traveled northward by separate routes, the [later settlers of] *Micoñinovi*⁴ holding to the east of the [later settlers of] *Walpi*.

¹ *Paláikwabi*, a legendary home on the Gila.

² Probably the Squash and Rain-cloud clans.

³ Even the southern clans are supposed to have originally emerged from the underworld through the Grand canyon, but after their emergence drifted into the south, just as the white men, who are said to have emerged from the same place, went to the far east.

⁴ This indicates that the two groups referred to were the Squash and Rain-cloud clans, for the former later settled on the Middle Mesa and the latter joined the Snake people at *Walpi*.

"The *Pátiki* traveled north until they came to Little Colorado river, and built houses on both its banks.¹ After living there many years the factional dissensions, which seem to have ever haunted these people, again broke out, and the greater portion of them withdrew still farther north and built villages the ruins² of which are still discernible not far from the site of the villages their descendants inhabit at present.

"The Squash [*Micoñinovi*] also trended slowly northward, occupying, like all their legendary movements, a protracted period of indefinite length—years during which they planted and built homes alternating with years of devious travel. They grew lax in the observance of festivals, and *Muinwa* inflicted punishment upon them. He caused the water to turn red, and the color of the people also turned red; he then changed the water to blue, and the people changed to a similar color. The Snow *katsina* appeared and urged them to return to their religion, but they gave no heed to him, so he left them and took away corn. *Muinwa* then sent *Palútskoñ*,³ who killed rabbits and poured their blood in the springs and streams, and all the water was changed to blood and the people were stricken with a plague. They now returned to their religious observances, and danced and sang, but none of the deities would listen to them.

"A horned *katsina*⁴ appeared to the oldest woman and told her that on the following morning the oldest man should go out and procure a root, and that she and a young virgin of her clan should eat it. After a time she (the old woman) would give

¹ Homolobi, near Winslow, Arizona. The several pueblos which these clans built and inhabited in their migration to Walpi were Kuñchalpi, Utcavaca, Kwiñapa, Jettypenhka (Navaho name of Chaves Pass and also the two ruins at that place called Tesbkwitcalobi by the Hopi), Homolobi, Sipabi (near one of the Hopi or Muki lutties), and Pakatcomo.

² The last pueblo inhabited by the *Pátiki* people before they joined the Walpi is now a ruin called Pakatcomo in the valley south of the East Mesa near the wash. It is a small ruin, not more than four miles away, and its mounds are easily seen from the mesa top.

³ The Great Serpent.

⁴ This was possibly the personation of the Sun or other solar deity.

birth to a son who would marry the virgin, and their offspring would redeem the people. The old woman and the virgin obeyed the *kacina*, and the former gave birth to a son who had two horns upon his head. The people would not believe that the child was of divine origin; they called it a monster and killed it.

"After this all manner of distressing punishments were inflicted upon them, and wherever they halted the grass immediately withered and dried. Their wanderings brought them to the foot of the San Francisco mountains, where they dwelt for a long time, and at that place the virgin gave birth to a daughter who had a little knob on each side of her forehead. They preserved this child, and when she had grown to be a woman, the horned *kacina*¹ appeared and announced to her that she would give birth to horned twins, who would bring rain and remove the punishment from their people. This woman was married, and the twins, a boy and a girl, were born; but she concealed their divine origin, fearing they would be destroyed.

"The *Patuñ* [Squash]² now moved to the Little Colorado where they built houses and met some of the *Pátiki* people to whom they related their distresses. A wise man of the *Pátiki* came over to them, and on seeing the twins at once pronounced them to be the *Alósaka*. They had no horns up to this time, but as soon as this announcement was made, their horns became visible and the twins then spoke to the people and said that it had been ordained that they were to be unable to help their people until the people themselves discovered who they were. The *Patuñ* were so enraged to think that the *Alósaka* had been with them,

¹ The horned *kacina* is supposed to be either the Sun or other solar deity. The term *kacina* is often used in a very general way to mean any divine personage, but at Walpi this is believed to be a secondary use of the name. Originally it was applied to certain personifications introduced by clans from the east, and later came to have a general application.

² Throughout the legend these are called the *Micoñinovi* people, but from the fact that the original settlers of the pueblo were of the Squash clans, the name of these clans is substituted in the remainder of the legend for the name of the pueblo which they founded.

unknown so many years, that they killed them, and still greater sufferings ensued.

"They again repented, and carved two stone images of the *Alósaka* which they painted and decked with feathers and sought to propitiate the mother. She was full of pity for her people, and prayed to the Sky-god¹ to relieve them. A period elapsed in which their sufferings were in great measure abated.

"The *Patuñ* then sought to join the *Pátki* clans, but the *Pátki* would not permit this, and compelled them to keep east of Awatobi.

"Many ruins of phratry and family houses of the *Patuñ* people exist on the small watercourses north of the Puerco at various distances eastward from the present village of Walpi. The nearest are almost fifteen miles, the farthest about fifty miles.²

"Their wandering course was now stayed. When they essayed to move farther eastward, a nomadic hunting race who occupied that region besought them not to advance farther. Their evil notoriety had preceded them, and the nomads feared the malicious influence of their neighborhood. It would seem, however, that instead of hostile demonstrations the nomads entered into a treaty with them, offering to pay tribute of venison, roots, and grass-seeds, if they would abstain from traversing and blighting their land, to which the *Patuñ* agreed.

"But these unfortunate wretches were soon again embroiled in factional warfare which finally involved all the Hopi, and the stone images of the *Alósaka* were lost or destroyed. Famine and pestilence again decimated them, until finally the *Alósaka katchina* appeared to them and instructed them to carve³ two

¹ That is, to the Sun, their father.

² There is here such marked contradiction of other legends that this account must not be accepted as final. Probably Awatobi, and possibly other pueblos on the same mesa, had *Patuñ* clans in their populations.

³ These are the two images found at Awatobi which this account considers in the opening pages, and the principal reason why the people from the Middle Mesa were so solicitous concerning them is shown in the closing paragraphs of the legend above quoted.

wooden images, but threatening them that if these should be lost or destroyed all the people would die."

Many other but widely divergent legends exist regarding *Alósaka*, a number of which are associated with the pueblo of Awatobi, which was formerly one of the most populous Hopi towns. At one time this village experienced drouth and famine, and *Alósaka*, from his home in the San Francisco mountains, observed the trouble of the people. Disguised as a youth he visited Awatobi and became enamored with a maiden of that town. Several times he visited her, but no one knew whence he came or whither he went, for his trail no one could follow. The parents of the girl at last discovered that he came on the rainbow, and recognized him as a divine being. The children of this maid were horned beings, or *Alósakas*, but their identity was not at first recognized.

Like all the cultus heroes, *Alósaka* is said, in legends, to have been miraculously born of a virgin. His father was the Sun, his mother an Earth-goddess, sometimes called a maiden. Like many gods, he traveled on the rainbow; he lived at Tawaki, the house of his father, the Sun, or the San Francisco mountains.

It would seem from all these stories that the *Alósaka* cult was vigorous in Awatobi, the ill-fated pueblo where the zealous Padre Porras lost his life in 1633, and that it was of southern origin, having been introduced into Awatobi by one of the phratries from the south which lived in the now ruined pueblos on the Little Colorado. The most complicated survival of the *Alósaka* cultus is to be expected in the Middle Mesa pueblos, because the phratry which introduced it founded some of these pueblos¹ and still survives there. The result of an examination of many *Alósaka* myths would seem to be a conclusion that he is a cultus hero of clans which came from the south.

¹ The Squash clan is extinct at Walpi.

TOTEMIC ASPECT OF ALÓSAKA

The *Alósaka* cult may be regarded as another form of that totemic ancestor worship which appears in all Hopi mythology and ritual. The male and female *Alósakas* are supposed to be ancestors of a cult society called the *Aaltá*, and are represented symbolically in the ritual by graven images, pictures, or personations by men. The name *Alósaka* is simply a sacerdotal name used in this society, but it is applied to a similar conception found in the worship of other societies under other names.

In the Snake-Antelope societies of the Hopi the male and female parents are called *Tcua-tiyo* (Snake-youth) and *Tcua-mana* (Snake-maid), which beings are personated in the secret exercises of the Snake dance by a boy and a girl appropriately clothed.

In the Flute ceremony the cult society ancestors are called the *Leñya-tiyo* (Flute-youth) and *Leñya-mana* (Flute-maid), who are represented symbolically by images on the altars and by a boy and two girls in the public exhibition.

In the *Lalakonti* ceremony these two ancestral personages are represented in a symbolic way by images on the altar and by sand pictures on the floor, and by a man and two girls in the public dance. These personages are called by the *Lalakonti* society the *Lakone-taka* and the *Lakone-manas* respectively.

In the *Mamvrantá* society they are called the *Marau-taka* and the *Marau-manas*, and are symbolically represented on the altar by figurines and in the public dance by a boy and a maid called the *Palahiko-mana* whose headdress with symbolic clouds and squash blossoms so closely resembles that of *Calako-mana*, or the Corn-maid,¹ that it is difficult to distinguish the two.

¹ In the horrible rites of the Aztec at their midsummer ceremony, Hueytecuilhuitl, a girl personating the Corn-mother, was sacrificed before the hideous idol of Chicomehuatl and her heart offered to the image. In the dances preceding her death this unfortunate girl wore on her head an *amalli* or "pasteboard" miter, surrounded by waving plumes, and her face was painted yellow and red, symbolic of the colors of corn. She was called *Xaloxinia* (pronounced *Shaloxia*). The Hopi Corn-maid, represented by a girl with a rain-cloud tablet on her head and a symbol of an ear of corn on her forehead, is called *Calako-mana* (pronounced *Shalako-mana*).

In the great *kacina* cult these two personages are called *Anwuchshotaka* and *Hahaiwugti*, or "Man of all the Crow clans," and "Mother of *kacinas*," respectively; but as this cult is very complex in the East Mesa towns, and is celebrated by many amalgamated cult societies, there are various other names for these two ancestors.

It is instructive to consider somewhat more in detail this aspect of the Hopi *kacina* cult in the two great characteristic festivals called *Powamû* and *Nimdn*.

Reviewing the Hopi calendar it is found that *kacina* worship appears in ceremonies from December to July, inclusive, and while none of the festivals between July and December is a true *kacina*, the majority of those during the remainder of the year bear this name. As expressed by the Hopi priests, the *Niman* ceremony celebrates the departure of the *kacinas* from the pueblos, to which they do not return for about six months. This *Nimdn* ("Departure") ceremony of the *kacinas* is celebrated in July, and no *kacinas* are personated in the Hopi pueblos until December. The time of the return of these supernaturals is not as distinct as that of their departure, and they may be said to straggle back in the December and January rites; but their return in force takes place in the February ceremony called *Powamû* which is made up wholly of characteristic *kacina* exhibitions.

It is of some interest to determine the month of the return, for there are *kacina* personations in December (*Soydluña*) and during the January moon, and it may be held that their appearance in the former proves that the advent of these worthies occurs in the month named. The chief participants in the December rite (and the same may be said of the January ceremony) are not distinctive *kacinas*, or rather there are other ceremonies not belonging to this cult in their composition, and no special distinctive *kacina* altars are erected. In the *Powamû*, however, there is a true *kacina* altar which is essentially the

same as that set up in the *Nimdu* when the *kacinas* leave the pueblo. *Powamú* may thus be regarded as the official celebration of the return, and from that time to July these personages dominate the ritual. But the rites of intervening moons are not all necessarily pure *kacinas*, even if *kacinas* participate in them. Thus, in the March ceremony, *Palúluikoñti* (*Unkwanti*), they are again subordinate. This is not a pure *kacina*, but that of another cult into which they have straggled or to which they have been added in the course of evolution. There are only two great *kacina* celebrations, *Powamú* and *Nimdu*, both controlled by the *kacina* chief, both with a true *kacina* altar, both free from other Hopi cults.

Some of the differences between the *Powamú* at Walpi and the other Hopi pueblos are due to the introduction of masked personifications at Walpi which are absent elsewhere. This may be explained as follows: Near Walpi there are two other pueblos—one Tanoan, the other peopled by descendants of Tanoan clans, neither of which has exerted an influence on the other pueblos. These Tanoan colonists have brought their own *kacinas* to the East Mesa of Tusayan, and while they possess no altar of this cult they contribute their distinctive *kacinas* to the Walpi *Powamú*. In the January ceremony they do the same, and while the Walpi priests are celebrating in that month a true Hopi Flute or Snake rite, Hano and Sitcomovi contribute masked *kacinas* which complicate the ceremony.¹ Hence the *Powamú* rites at Walpi became more complicated than those performed elsewhere at the same time, because of the proximity of two pueblos in which there are variations in the *kacina* cult that are peculiar to them; and as it is probable that the *kacina* rites in other pueblos have not been affected by *Asa* and Hano clans, we should expect to find in them a less complex presentation of the rites of the *kacina* cult.

¹ The kiva rites are complicated at Walpi by the visits of these personifications from the two neighboring pueblos.

This is also in accordance with tradition, for the *Honani* clans, which introduced the *katsina* cult from Kicuba, went first to Oraibi, from which pueblo the cult was distributed to the other pueblos. The Walpi *katsina* altar is simple as compared with that at Oraibi; it has no figurines because it is derivative, and the same fact may explain why Walpi has but one *Powamû* altar while Oraibi has several. The Walpi *katsina* altar is simpler than that of Oraibi,¹ because derivative, but the *katsina* personations in this pueblo are more numerous and varied because the *Ása* and other Tanoan clans have contributed many new forms.

If we separate from the Walpi *Powamû* the elements introduced by *Ása* and Hano clans, we find in it the same personages as in the Oraibi celebration—*Ahole*, a Sun-god who flogs the children; the *katsina* cultus hero; *Hahaiwugti*, the old woman, and *Eototo*. The last mentioned, a cultus hero of the *Kokop* people and a tutelary god of Sikyatki,² was an early addition to the Walpi ritual before the *Powamû* was celebrated. He was historically the first *katsina* to come to the pueblo, as he now leads the procession of masked priests in their dramatization of their advent and exit. Under the name *Masanuh* he invaded the Snake rites, and as *Eototo* he became a masked personage in the *Powamû* and the *Nimdn* when these ceremonies were added to the Walpi ritual.

Conclusions

1. There survives in the Hopi ritual a worship of horned beings called *Alósakas*, which once existed at the now ruined pueblo of Awatobi.

¹ It is much to be hoped that the very elaborate *Powamû* of Oraibi will be accurately described in detail. The indications are that it will be found to be the most instructive of all presentations of this ceremony.

² Sikyatki was probably a flourishing pueblo when the Snake people first settled Walpi. The tutelary god was *Eototo*, or *Masanuh*, whom the early Walpians overthrew and who gave them the site for their pueblo. At the destruction of Sikyatki by the combined Horn-Snake and Horn-Flute people, some of the survivors settled at Walpi, and their descendants are intimately connected with the *Eototo* cult which is incorporated in the *katsinas*. In the celebration of the Snake-Antelope ceremony he is known by the name of *Masanuh*, and a prayer-stick is made and consecrated to him at that time.

2. The purpose of the rites performed in this cult is to cause seeds, especially corn, to germinate and grow, and to bring rain to water the farms.

3. The *Aaltá* priesthood at Walpi, who personate *Alósakas*, perform duties suggestive of those of warriors.

4. The intimate relationship of *Alósaka* rites with those of the Rain-cloud clans supports legends that they were at one time associated and brought from southern Arizona by the Squash people who formerly lived with or near the Rain-cloud people along Little Colorado river.

5. The *Alósaka* cult is a highly modified form of animal totemism, and the *Alósaka* represents the mountain sheep.

ORIGIN OF THE NAME "INDIAN"

By F. F. HILDER

An historian has written that the two most important events in the history of the world were the birth of Christ and the discovery of America. But even the most enthusiastic and imaginative of the early adventurers did not and could not conceive the enormous and far-reaching results of that discovery and the mighty influence it would have upon the destinies of mankind.

From the anthropological point of view the western continent stands as a world apart, with people unlike any other, with languages, arts, and customs essentially their own. On this continent opportunity is afforded to study man under the most primitive conditions and under circumstances that furnish the best indications of his independent development. Many fantastic theories have been promulgated to prove the consanguinity of the Red Man with archaic races of the Old World, but no conclusions that will bear scientific test have ever been reached in support of them. On any theory of the origin of the human race, the widely diversified indigenous stocks of America must have required an extremely long period for their development; and by any philological speculation as to the origin of languages, a vast extent of time must have been required to admit of the development of the almost numberless aboriginal dialects of the American continent. So far as any conclusive evidence is concerned, there is nothing in the physical or mental condition of the aboriginal Americans which requires us to postulate for them a foreign origin.

The origin of the movement which brought these primitive people in contact with civilized men of the Old World, through the adventurous voyage of Columbus, can be traced backward for several centuries, and it is to this that we must look for the basis

of the idea which led to the bestowal of the name of "Indians" on the American aborigines.

For centuries Venice and Genoa had been enriched by the commerce of the Orient, carried on by caravans from China and India overland to the Black sea, where they were met by the ships of the European republics. There on the peninsula which we now call Crimea was the nucleus of Genoese prosperity. This commerce, so vital to both Venice and Genoa, was ruined by the Mohammedan deluge that swept over western Asia and eastern Europe, and when in 1475 the Turks absorbed her Black Sea colonies Genoa began to wither. Christopher Columbus was a Genoese and a sailor; the surroundings amid which he grew to manhood were all influenced by the wealth that had been poured into his native city by the products of Asia.

Great as this had been, the far East was rendered in a still greater degree the Eldorado of the world by the romantic tales of travelers. Marco Polo, the Venetian traveler, at the end of the thirteenth century published in manuscript (as the art of printing had not then been invented) a narrative of his travels, in which he gave a fabulous account of the wonderful country of the Grand Khan with its gold-covered palaces, profusion of rare flowers, luscious fruits, sweet spices, and boundless stores of gold, silver, and precious stones. These marvelous tales were later reinforced by the narratives of other travelers, such as the Friar Odericus and Sir John Mandeville, until, in the excited imaginations of the European people, nothing but ready means of access to the nations of Asia were wanting to ensure boundless prosperity and wealth.

That Columbus had thoroughly imbibed and assimilated this illusive literature is evidenced by some of his letters after the discovery of the New World, and when he saw the end of the stream of wealth which had poured from the golden source, it was only natural that he, as a sailor, should conceive the idea of finding a sea-route by which its flow might be renewed.

At that time it was generally assumed that the earth was flat, and the question arose, Why could not ships be sailed around the southern extremity of Africa to the Orient? This idea was entertained by Prince Henry of Portugal, and Portuguese mariners found the passage by the Cape of Good Hope.

Columbus, on the contrary, was deeply imbued with (what was then a heresy) the idea that the earth was round, but he also had a conviction that it was not more than 15,000 miles in circumference; he therefore reasoned that as Cathay was estimated to be by the land route 12,000 miles from Spain, the distance to the coast of Asia by the western route could not be more than 3,000 miles.

We are all familiar with the difficulty experienced by Columbus in finding the means to put his theory to practical test, and how doggedly he persevered in spite of all discouragements and defeats. But he had the courage of his convictions, and it required no ordinary daring to sail into the unknown in despite of the superstitions of his day. There were in existence legends that in that dark and stormy ocean were vast whirlpools, abysmal oceanic cataracts, sea-monsters, and malignant genii. Columbus would not have been surprised had he met with any of these horrors, but his indomitable courage and obstinacy and pride in his own opinion carried him forward to success. The time had come when another continent was to be added to the world, and, as has always occurred in all great historic emergencies, the man arose to meet this one.

The Discoverer sailed from Palos, August 3, 1492, carrying with him a chart or map constructed on the theory of his friend Toscanelli (the Italian astronomer and cartographer, who also believed in the spherical form of the earth), and what he doubtless considered quite as important, a letter from King Ferdinand to the Grand Khan.

When at last he sighted land on the western horizon, Columbus naturally supposed it to be the coast of India; indeed, from

the idea that the islands and coasts he had discovered were a part of Asia, he never wavered, but died firm in that belief. It is therefore only natural that Columbus should have applied the name of "Indians" to the natives of the newly discovered lands, and no one in those days doubted the absolute correctness of his conclusions or the appropriateness of the term by which the new-found people were designated.

Among the few persons who manifested confidence in Columbus and had given him effective aid at the Spanish court, was Louis de Sant Angel, a court official, who not only advocated his cause, but advanced from his own resources a million maravedis to enable Queen Isabella to render the necessary aid to the Discoverer. On his return from his first voyage, when he had been driven into the port of Lisbon for shelter from tempestuous weather, it was but natural that to this benefactor he should send the first news of his success, which he did in the form of a letter dated February, 1493. The following extracts from this missive will prove how thoroughly he was convinced that he had reached the Indies. He says:

"As soon as I arrived in *the Indies*, at the first island at which I touched I captured some of the natives, that we might learn from them and obtain intelligence of what there was in those parts."

Again he says, referring to the Caribs:

"These people have many canoes which scour all the islands of *India* and plunder all they can."

Then we notice a paragraph relating to Cuba in which, for the first time, the name *Indians* is applied to the American aborigines:

"I went along the coast 107 leagues—besides these 107 leagues there were further west two provinces to which I did not go which must be about 50 or 60 leagues long according to what I can make out from the *Indians* I have with me."

In another paragraph the Marco Polo myth of the Grand Khan crops out. Speaking of what is now San Domingo, Columbus says:

"In this Española and in the best district are gold mines, and on the other side, from thence to terra firma, as well as from thence to the Great Khan where everything is on a splendid scale."

The rank and titles bestowed on Columbus by his sovereigns are proofs that they shared his belief that he had reached Asia. In a letter which he wrote (before starting on his fourth and last voyage, in the spring of 1502,) to the governors of the Bank of Saint George at Genoa, which was in those days to the commercial world what the Bank of England is today, he signs himself, "The Great Admiral of the Ocean Seas, and Viceroy and Governor of the Islands and mainland of Asia and the Indies."

On May 4, 1493, Pope Alexander VI issued a bull, granting to Spain all the newly discovered lands lying south and west of a line drawn from the Arctic to the Antarctic pole, in which appear the words: "containing in this donation whatsoever mainlands or islands are found or to be found toward *India*."

Another Italian sailor, a Venetian, Giovanni Caboto, or, as he was called in England, John Cabot, made a voyage in 1497 under the auspices of King Henry VII and reached the continent of North America, which he described as "the territory of the Grand Khan."

We therefore see that although the application of the name "Indians" to the native peoples of America was the outcome of an error, it was at the time one that was excusable; but there is no reason for its continuance. It is, however, firmly entrenched in the popular mind, as if it was felt to be a point of honor to perpetuate the illusion of the great navigator, and it remains to be seen if it may be possible to supplant it by a more appropriate and scientific designation.

A NEW JOINT-FORMATION

By ALEŠ HRDLÍČKA

The specimen herein described shows in a very remarkable and beautiful way the great *vis medicatrix naturæ*. It consists of bones of the left arm and forearm, found by Mr Harlan I. Smith during his exploration of a prehistoric burial-place on the Fox farm at Mayslick, Kentucky. This exploration was conducted under the direction of the department of anthropology of the American Museum of Natural History. To the officers of the museum I am greatly indebted for the privilege of studying this interesting specimen, and for permission to publish the following description and the accompanying photographic illustration.

As will be seen from the plate (XXVII) the interest of the specimen lies mainly in the fact of a new joint-formation between the head of a dislocated radius and a bony process proceeding from the distal end of the humerus.

The genetic history of the new joint, from what we can observe in the bones, is as follows: Originally there were here the three normal, and in all probability already adult, bones of the arm and the forearm. Subsequently the ulna became fractured a little above the middle. This was probably an incomplete fracture, and at the same time there took place a complete forward dislocation of the head of the radius, but without either this bone or the humerus being injured. Neither the fracture nor the dislocation was reduced. The broken ulna became united by a small callus. More callus bone was thrown out around the spine of the proximal segment, which was inclined to and possibly at times touched the interosseous border of the radius, and eventually this part of the proximal segment became united to the radius by an osseous band nearly 3 cm. wide.

The head of the radius remained fully dislocated, and has un-



A NEW JOINT-FORMATION

a. The bones separated. A. The bones in position

dergone apparently no change whatever, unless it is a very slight lengthening. This supports the probability that the bones at the time of the fracture and dislocation were those of a fully developed adult. There is no indication that the humerus was in any way injured; nevertheless, at some time after the injury, there started from the anterior border, and partly also from the external surface of the humerus, immediately above the coronoid fossa, a bony process, which grew forward, downward, and slightly outward until it exactly met the free and, as already stated, unchanged head of the radius, forming with this head not an ankylosis, but a new, free joint. The mean length of this process is 3.1 cm.; its circumference at its middle is 3.5 cm.; the diameters of the joint are antero-posteriorly 2.2 cm., and laterally 2.4 cm. The process ends in an articular socket which is 7 mm. deep in the center, but as parts of the border are broken on one side, it might have been 1 mm. deeper. The surface of the socket presents in the middle an irregular row of large vascular perforations, but outside of these it is for the greater part smooth, and there can be no doubt that it was covered with synovium. The distal two-thirds of the process are entirely free from the humerus.

We have here, in brief, then, the following conditions: The normal and apparently uninjured humerus sends out through all the parts superposed a regular new formation—a veritable process—to meet, support, and form a joint with the head of the dislocated radius almost an inch and a half distant. Such formations are no doubt extremely rare in man. I have no personal knowledge of anything closely similar, and I am unable to find such a case described. Regenerations of bone to which the condition in the specimen is related, are much more frequent in the lower animals than in man.

As to the exciting cause of the new process of bone, it most probably was a moderate injury of either the ligaments or the periosteum of the distal end of the humerus.

MAUDSLAY'S ARCHEOLOGICAL WORK IN CENTRAL AMERICA

By CYRUS THOMAS

The object of the present paper is to note briefly some of the results of Maudslay's explorations in Central America, and to call attention to some of the questions suggested thereby. The paper, however, is not intended as a review of the archeological portion of his *Biologia Centrali-Americana*, being limited almost wholly to his work at Copan.

One gratifying result of Mr Maudslay's explorations is the testimony furnished thereby to the general correctness and value of the works of John L. Stephens and the drawings by Mr Catherwood. In regard to the portion relating to Copan, he says: "Almost all the sculptured monuments at Copan which were then to be seen above ground are described and figured in Stephens' work." He adds, however, "Like all other visitors to the ruins, he failed to understand the nature of the ruined structures, mistaking houses for fallen city walls, and seeing no trace of stone roofed dwelling-houses or temples" (Pt. 1, Text, p. 9). The personal narrative of Mr Maudslay in reference to his researches is very brief, in fact far too brief to satisfy the desire of his readers, especially as his descriptions are clear and readily understood. Those in regard to his work at Copan, to which our notes are mainly confined, relate chiefly to the difficulties he encountered.

The ancient city or pueblo of Copan was situated on Copan river, a tributary of Rio Motagua which flows into the Gulf of Honduras. It was situated just within what is now the western boundary of the Republic of Honduras (lat. 14° 50' 30" N.), on

the right bank of the river. The valley at the point where the ruins are found is about a mile and a half in width, margined on each side by a line of hills.

In following Mr Maudslay in his descriptions and numerous and splendid illustrations, photographic and drawn, it soon becomes apparent to the reader who has studied the works relating to the archeology of Central America and Yucatan, that here we see the culmination of Mayan art and the most advanced step of Central American culture.

Although it will be necessary for the reader, in order to fully understand any description of the ruins, to have Mr Maudslay's plates, or those of the Peabody Museum, before him, yet a general idea of them may be obtained from the outline sketch of the ground plan here given (figure 15). The area inclosed in each of the outlines *A*, *B*, *C*, is elevated in the form of a terrace, from ten to

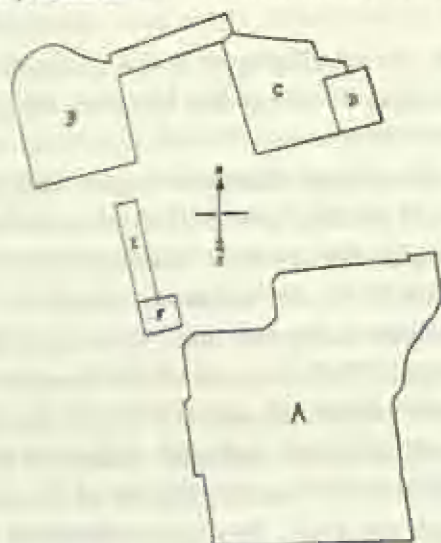


FIG. 15.—Outline of the Copan ruins.

twenty feet high, generally reached by steps from the front (facing portions) and sides (except the eastern side of *A*, the base of which is washed by the river). *D* and *F* are pyramids, and *E* an elongate ridge, probably the débris of ruined houses. It was

on these three chief terrace groups that most of the structures were built. It is true that the ground between these two terraced areas (regarding *B* and *C* as one), and to the west and south of *A*, and even to the north of *B*, *C*, is dotted with remains, but they are of comparatively small size, consisting chiefly of detached small or moderate-sized pyramids, buildings, monoliths, etc.

The large terrace, *A*, was evidently the heart of the sacred city, the area on which the chief labor of the native builders and artists was bestowed. As we follow Mr Maudslay while he slowly and laboriously plows his way into the bowels of the forest-covered mounds, viewing in his excellent photographs the sights he beheld as the covering of earth and débris was removed, it is difficult to realize the fact that all this is the work of native American artists, and not the crumbling temples and palaces of the Orient.

As typical of the art displayed in the works at this place, Mr Maudslay's discoveries in one of the so-called temples may briefly be noticed.

In Part 1 of the plates relating to Copan, following the maps, plans, sections, and photographs of the group and separate ruins, Mr Maudslay begins the detailed illustrations with the temple numbered 11, located on the northwest corner of terrace *A*, the chief point of interest being the inner doorway. In his explanatory notes, he says: "To the south of the Great Plaza [the open space between the terraces *A* and *B.C* in our figure] there arises [going southward] a broad stairway, which, as it ascends the slope, divides into three separate flights of [stone] steps, each narrowing toward the top. The spaces between the steps appeared to have been highly ornamented, and the carving (Plate IX *b*) had probably fallen from that position. The steps on the right and left lead to level terraces, and the center flight must have led to the temple (No. 11) which stood at a still greater elevation. This building presented the appearance of a formless

heap of stones, out of which a huge ceiba tree was growing. Some portions of the chambers which are shown in the accompanying plan were excavated. The porches on each side probably extended some distance beyond the line of the walls of the building. The roof and superstructure had entirely disappeared, but the inner wall was in places perfect up to the spring of the vault." It may be assumed that the ceiling was in the form of the triangular or inverted V-shape vault, as at Palenque, although it is not shown by Mr Maudslay's figures, as the roofs had fallen.

The first portion of the doorway—a kind of entry or short hall—which he notices, is "a step about eighteen inches high and eighteen feet long, formed of two blocks of stone, projecting in front of the inner doorway; the face of this step is ornamented with a number of figures seated cross-legged and covered with elaborate breast-plates and other ornaments in sharp and well-preserved carving."

Examining the splendid autotype (Pt. 1, pl. 8), it is seen at a glance that the figures on this step are almost exact repetitions of those on the altar found at the same locality, which may be seen by those who do not have Maudslay's figure, in Stephens' plate.¹ The heads are covered by the same turban-like caps, the breast is covered with similarly ornamented breast-plates, the figures sitting cross-legged on hieroglyphics and arranged in two groups facing the middle. On the step are twenty personages in two groups, the ten on the left facing the right, and the ten on the right facing the left. On the altar there are but sixteen figures, four on a side. Between the two groups on the step are two short columns of glyphs.

What the scene is intended to represent we have, at present, no satisfactory means of judging. That the figures do not portray warriors or military personages may be assumed from the fact that they bear no arms or military insignia, and that nowhere

¹ *Travels in Central America, Chiapas, and Yucatan*, 1, pp. 42, 43.

in the entire ruins, so far as they have been examined, has anything indicative of war or strife—unless the condition of the ruins furnish it—been found. The city was probably a religious center. The figures may be symbolic, and those on the step, numbering twenty, might be supposed to represent the twenty days of the month or twenty of the periods called by Mr Goodman "*ahaus*"—the 360-day period or third order of units. The fact that there are only sixteen on the altar might seem to controvert this suggestion, but it is a fact that, although it takes twenty of the 360-day periods to make the next higher period, in the representation of these on Stela J of the same locality but sixteen are given. This at best is but a mere suggestion, yet in favor of the supposition that they may represent the days, the breast-plate of one of the figures bears clearly and distinctively the symbol of the day *Ik*. Be this as it may, it becomes more and more apparent, the more we study the inscriptions, that they contain nothing historic, and are to a very large degree symbolic, time counts being the leading subject.

We notice in regard to Mr Maudslay's figures of this step that in the autotype Pl. 8 the ten personages on the right half are all shown, some, it is true, being imperfect in lacking certain portions of the body, but all the figures are there; while in the autotype Pl. 7*a*, showing one side of the doorway, including the right half of the step, the third and fourth figures (counting from the middle toward the right) are entirely wanting, the photograph apparently showing a break or scaling here in the stone.

Although the figures may, as suggested, be symbolic, yet there is such a strongly marked facial type as to render it probable that the artist drew in part at least from life. Judging by the skeleton head at one end of the step and the tail-piece at the other, the portion on which the figures are carved is to be regarded as the body of the animal or monster. Another step of this temple shows an animal, or rather dragon form, apparently of the saurian type.

Parts of the cornice of the above-mentioned doorway, shown in Maudslay's Pl. 7, indicate very elaborate ornamentation, mingled with which, as on the step, are numerous hieroglyphs. In the western court of the same temple was found a cross with arms of equal length, the center occupied by a cross-legged human figure.

There was discovered a doorway of another temple (16) which also has the face of the entrance step ornamented with hieroglyphics and masks, the ends being flanked by skeleton heads. Extending up the sides of the doorway and over the top is a series of carved figures, human and grotesque, worked into S-shape scrolls, the whole so carved as to represent an elongate-arched human serpent, supported at each end by a stooping human form. It is probable, judging from the limited remains, that the doorway of temple No. 11 was similarly ornamented.

That they are symbolic will not be doubted. As the reader will doubtless recall like overarching forms both in native American and in Oriental mythology, we shall not enter into a discussion of the subject here. It is desirable, however, to call attention to the strong resemblance of the dragon figure found at temple No. 11, above mentioned, to the figure in plates 4 and 5 of the Dresden Codex, best shown in Kingsborough's reproduction. This resemblance is strong enough to justify the belief that the figure was a conventionalized one among the tribes of Copan and in the locality where the Dresden Codex was made. Whatever may have been the idea symbolized by a human head issuing from or being held in the jaws of a reptilian monster, it must have prevailed throughout southern Mexico and all of Central America, in all parts of which the symbol is found, reaching its greatest development, though in rudest form, in Nicaragua.

As we cannot in a brief article allude to all of Mr Maudslay's discoveries at this place, we may say in general terms that those described are typical of the others. The great monoliths and altars are well known through Stephens' works and Catherwood's pencil; but it was not until Mr Maudslay's photographs and

drawings were given to the public that the ornamentation and inscriptions could be studied critically. While we must bestow on the Peabody Museum the praise for giving, by photographic illustration, the best general representation of the ruins and the clearest description of the substructures yet produced, we must look to Maudslay for the particulars, such as the ornamentation, and above all for the inscriptions.

It is only by means of the Peabody Museum photographic illustrations that those who cannot visit the locality may obtain an idea of the immense amount of labor that must have been expended on the various structures there. From these it would seem that, in addition to the stone in the ruined structures covered by the mounds, almost the entire surface of the terraces, pyramids, and slopes had been covered by wrought stones, many of them figured. The slopes or rises to the terraces, and even parts of the pyramid slopes, consisted of stone steps, the faces of many of which were covered with carved figures including the human form, skulls, heads, hieroglyphics, etc., and where not occupied by steps the spaces were covered by wrought stone often ornamented.

When we consider that all this work must have been done without the aid of beasts of burden, wheeled vehicles, machinery, or iron implements, time enters into the problem as an all-important factor. The multiplication of hands may account for the quarrying, transportation, and laying of the unornamented stone; but we cannot suppose a like multiplication of artists possible, hence the necessity of a sufficient time element. If we could adopt the theory advanced by Mr J. T. Goodman in his monograph on *The Archaic Maya Inscriptions*, which forms one of the volumes of Mr Maudslay's series, we would have no trouble on the time score.

This author distinguishes the monuments of Palenque, Copan, and Quirigua as "archaic" when compared with those of the peninsula of Yucatan, the structures of the latter region being

erected after building in the former regions had ceased. By means of his interpretation of the inscribed glyphs, Mr Goodman estimates the lapse of time between the earliest and latest inscriptions of the "archaic" monuments at 8,383 years, the latest dating back from the present time not less than 2,300 years. This estimate will certainly afford ample time for the builders and artists, especially when we take into consideration the necessary assumption that at the date of the earliest inscription the Mayas had already reached that stage of culture manifested by their works—that stage from which apparently but little advance was made in the 8,000 years that followed. Yet, strange as it may seem, according to the theory advanced, this culture did not find its way into the peninsula until the close of this period. "We go back," says Mr Goodman, "ten thousand years and find them [the Mayas] then civilized. What other tens of thousand years may it have taken them to reach that stage? From the time of the abrupt termination of their inscriptions [which he places at 2,348 years preceding 1895], when all suddenly became a blank, to that remote first date, the apparent gradations in the growth of their civilizations are so gradual as to foreshadow a necessity for their 280,800 recorded years to reach the point of its commencement. Manifestly, we shall have to let out the strap that confines our notion of history."¹ The last statement is undoubtedly correct if we accept his theory; and certainly there can be, on this hypothesis, no complaint as to want of time.

Although we must differ *in toto* with Mr Goodman in regard to the age of the works, we are inclined to agree with him in reference to the cause of the apparently sudden stop in the development of culture among these nations; that while it may have been due in part to the invasion of savage hordes, the chief cause was domestic war. It is true, as above stated, that at neither Copan nor Palenque are there any indications of war or

¹ Page 149.

military achievements; the warrior is unknown. The cities were evidently sacred centers, yet the calamity which overwhelmed them, or at least put a stop to their progress, if not the Spanish invasion was domestic wars or invading foes or both. The condition of the Central American tribes at the time of the Spanish advent is a problem that has not been satisfactorily solved; and a full and satisfactory account in English of the early operations of the Spaniards in Central America is yet to be written. It is only when the line between what must be attributed to them and what preceded their coming has been carefully and critically drawn that the immediately preceding condition of the tribes can properly be discussed.

Mr Goodman's important discovery of the signification of several of the glyphs of the inscriptions, and Mr Maudslay's large and clear photographic reproductions of the inscriptions themselves, enable us to give a still higher estimate of the culture of the Mayas than heretofore; they also enable us to confirm Dr Förstemann's interpretation of the high numeral series of the Dresden Codex and to understand more clearly their signification; and they serve to show the close relation of the time symbols and time systems of Copan, Tikal, Palenque, and the Dresden Codex to one another, a relationship much closer than that which has been inferred from the historical records.

However, it must be said that while this new material and the recent discoveries throw much additional light on the past of Mayan art and Mayan culture, they tend to confirm the already growing belief that this culture was limited to a comparatively few lines, chiefly architecture, art in painting and sculpture, time counting, and the time system. When it is clearly proven by the inscriptions and the Dresden Codex that the Mayan count reached to and included the sixth order of units in the vigesimal system, it gives us a high opinion of their mathematical attainments.

In conclusion it may be said that the results of the explora-

tions by Mr Maudslay, Mr Holmes, and the Peabody Museum, and the discovery by Mr Goodman in regard to the signification of some of the glyphs of the inscriptions, have thrown a flood of light on the past of Mayan culture that will undoubtedly enable other workers in this field to solve many of the problems that have so long remained unraveled.

ANTHROPOLOGIC LITERATURE

The Mythology of the Bella Coola Indians. By FRANZ BOAS. (Memoirs of the American Museum of Natural History, vol. II; Anthropology 1.) New York: 1898. 4°, pp. 25-127, pls. vii-xii.

The institution of "The Jesup North Pacific Expedition," in 1897, marked an event in the history of American anthropology. Some of the preliminary results have been made known by different collaborators in the expedition in several preliminary announcements; the more full and elaborate results are now appearing in a sumptuous series, of which the memoir under notice is the second.

The Bella Coola comprise a small tribe of coastwise Amerinds of British Columbia; the designation being a corruption of the name by which they are known to the neighboring Kwakiutl tribesmen. They seem to be a remnant of larger groups, and have no comprehensive name of their own. Their language belongs to the Salishan stock, though they are now cut off from their more southerly colinguals by intervening Athapaskan and Kwakiutl tribes, and have furthermore undergone modification through intermarriage with their northerly neighbors. As is normal to peoples of mixed culture and blood, they have an exuberant mythology, which is noteworthy for the number of deities and for the perfection of the hierarchy in which they are arranged. They believe in five worlds, two above and two below the earth: in the uppermost resides the supreme deity, "a woman who interferes comparatively little with the fates of mankind" (p. 27), while in the center of the next lower world stands the house of the gods, the residence of the Sun and other deities; then follows the earth, as an island swimming in the ocean; the nearer underworld is inhabited by ghosts free to rise to the lower heaven, whence they may be sent again to earth, while the lowermost realm is occupied by ghosts of a second death, from which there is no resurrection. In the fiducial observances, comparatively little attention is paid to the supreme female, while special prayers and oblations are made to the Sun and to various subordinate tutelaries, including the Moon. As usual among primitive peoples, most of the deities are personified in zoic form, though some of the forms (e. g., the Thunder-bird) are mythic. The traditions in which the mythology is crystallized are (quite naturally, in view of the

composite genesis of the tribe) frequently incongruous, different families reckoning descent from diverse lines of mythical ancestry; and these family traditions constitute important hereditary possessions, which are carefully reckoned as the most highly valued property in arranging marriage, adoption, etc. These family traditions are given tangible form in crests, akin to those of European heraldry, and in ceremonial masks, in which the Bella Coola are peculiarly rich. Naturally the prominence of the family tradition is reflected in the social organization. The tribe is at present endogamic—though the extensive admixture of culture and blood betokens alien affiliation, at least in past generations.

The record, as a whole, bears inherent evidence of unusual thoroughness of inquiry, and exceptional appreciation of primitive characteristics; the author was evidently interested in equal measure in the philology, mythology, and sociology of the tribe, and fully mindful of their esthetic and industrial characteristics; accordingly, the treatment is a model of completeness. On the whole, the Bella Coola afford a peculiarly instructive example of Amerindic mythology; and the value of the example to the anthropologists of the world is enhanced to the highest standard by Dr Boas' thorough treatment. His monograph seems destined to become a classic in American anthropology.

W J MCGEE.

Anthropologie des Anciens Habitants de la Région Calchaquie (République Argentine), par HERMAN F. C. TEN KATE. (Anales del Museo de la Plata, Sección Antropológica, 1.) La Plata: 1896. Folio, 62 pp., 17 pl.

In the introduction the author tells us that the Calchaquí region is in the northwestern part of Argentina, and comprises a large part of the provinces of Catamarca, Tucuman, Salta, and Jujuy. It is a high, mountainous region, and it is now arid; but it shows evidences of having been once fertile and well populated with a prosperous race who had made considerable advances in architecture, agriculture, metallurgy, weaving, ceramics, and other useful arts. Ancient ruined cities and fortresses abound in the region. Interment was conducted in several different ways, depending, it is thought, on the different social conditions of the deceased. The decay of this civilization is supposed to be due, in part, to conquest and in part to climatic changes. The present aboriginal inhabitants of the region, few in number, possess some characteristics of the ancient people and are supposed to be their mixed descendants.

The work is devoted chiefly to a description of the human bones found in the Calchaquí region, and this has been achieved in the careful,

complete, and scholarly manner which we have reason to expect from the accomplished hand of Dr ten Kate. We have not space to quote all his interesting and instructive conclusions; but will refer especially to a matter which is of high interest to North American scholars, and this consists in the numerous and striking resemblances which he has found between the ancient race of Calchaqui and certain peoples of our own Southwest—of New Mexico and Arizona—the Saladoans and Cibolans. Dr ten Kate was connected, as anthropologist, with the Hemenway Expedition while it was excavating in Salado valley and near Zuñi; he has written a work on *Somatological Observations on the Indians of the Southwest*, and is thus especially qualified to speak of the resemblances between these races, so far separated geographically. He treats of such similarities in various parts of his essay, as in discussing modes of interment, deformities of skulls (he describes six varieties of deformation), small cranial capacity, diseases of bones, measurements of scapulæ and pelvis, the olecranon perforation, the tibio-femoral index, the low stature, the relatively frail osseous structure, etc., of the ancient Calchaqui. The following is quoted from his conclusions:

"Quant aux Saladoans et Cibolans, représentants de cette ancienne civilisation dite Shiwi, que j'ai tant de fois rapprochés des Calchaquis, il ne me reste qu'à rappeler leur brachycéphalie excessive, leur petite taille, leurs os hyoïdes aux éléments libres, les analogies mythico-religieuses et mythico-sociologiques enfin qui ont dû exister chez ces deux civilisations indigènes d'Amérique à leurs limites extrêmes et que j'ai déjà résumées autre part il y a quelques années." [As for the Cibolans and Saladoans, representatives of that ancient civilization called Shiwi, whom I have often connected with the Calchaquis, I need only recall their excessive brachycephaly, their low stature, their hyoid bones with free elements, the mythico-religious and the mythico-sociologic analogies which must have existed among these two indigenous civilizations at their extreme limits and which I have already described elsewhere some years ago.]

Although the title-page is partly in French and partly in Spanish, the text is wholly in French. The work appears as a large folio, beautifully printed on heavy paper, and abundantly illustrated in a most artistic manner. It does credit to the Museum of La Plata and to its worthy director, Sr Moreno.

WASHINGTON MATTHEWS.

Crítica de la Lengua Auka del Señor Raoul de la Grasserie. Por RODOLFO LENZ. (Publicada en los "Anales de la Universidad" de Agosto.) Santiago de Chile: 1898. 8°, 21 pp.

Kritik der Lengua Auka des Herrn Dr. jur. Raoul de la Grasserie (Membre de la Société de Linguistique de Paris). Eine Warnung für Amerikanisten. Von Dr. RUDOLF LENZ. (Separatabzug aus

den Verhandlungen des Deutschen Wissenschaftlichen Vereins in Santiago, Band iv.) Valparaiso: 1898. 8°, 53 pp.

In these critical publications, the well-known philologist of Santiago de Chile undertakes to rectify what he conceives to be serious errors, both in methods and results, on the part of an equally well-known student of Amerindian languages at secondhand. Dr Lenz has the immeasurable advantage of personal acquaintance with the native tribes whose activities have interested him so deeply, and whose tongues he has so industriously and faithfully recorded; and his expressions are accordingly entitled to serious and respectful attention. His "Conclusiones" translated freely from the first-named critique are as follows: (1) The introduction relating to the Araucanos abounds in incongruities. (2) The grammar comprised in the book is a mediocre translation into French of the most incomplete of the ancient grammars, viz.: that of Padre Luis de Valdivia, 1606. (3) The extracts from the vocabularies of Valdivia and Febrés-Larsen are uncritical, and contain many hundreds of mistranslations and manifest errors. (4) The Araucanian texts from Valdivia are badly reprinted and worse analyzed; those taken from the "Estudios Araucanos" [of the author] are so disfigured by misinterpretations of phonetic signs and of words as to be rendered useless. (5) In consequence, *the whole book is entirely without utility or the slightest value*; it adds nothing to our knowledge of the language, and is quite inferior to the works of the missionaries of past centuries. (6) By reason of the thousands of errors and imperfections, *it is utterly impossible to use the work either for scientific or practical purposes*. In his final conclusion, Dr Lenz questions M. de la Grassie's scientific knowledge and even his scientific and literary integrity, and ends by expressing the hope that the publication of such works on the American languages may be discontinued.

W J McGEE.

Chess and Playing-Cards. By STEWART CULIN. (Annual Report of the Board of Regents of the Smithsonian Institution . . . Report of the U. S. National Museum, 1896.) Washington, 1898. 8°, pp. 665-942, pls. 1-50.

During recent years anthropologists have given much attention to games, especially those of primitive peoples. Various publications have resulted. The eminent Briton, Tylor, has described and discussed the games of the Amerinds; Cushing has brought out the exceeding significance of the arrow in primitive games; Director Culin has issued a luminous monograph on the games of Korea, China, and

Japan, in addition to lesser writings of standard value; while other contributors have added their quota to the growing literature of the subject. Some of the contributions are primarily descriptive, with an undertone of theory governing the arrangement; others, like the memoir under notice, are essentially descriptive and comparative, the arrangement being shaped by the relations brought out through extended comparison. Collectively, the publications, especially those of Messrs Culin and Cushing, have reduced the chaos of primitive games to fairly satisfactory order, and have furnished an apparently sound basis for further inquiry. In detail, *Chess and Playing-Cards* is a catalogue of games and implements for divination exhibited at the Atlanta Exposition of 1895; in substance, it is the richest contribution thus far made to game-science—and that despite the fact that many of the most significant relations are left to be read between lines of too-condensed description.

The science of games began with the discovery that the gaming of primitive peoples is primarily divinatory or sortilegic; it took final shape through the further discovery that most of the divinatory devices are traceable to that fecund seed of intellectual product, the arrow. The first of these discoveries defined the dynamic or actional basis of gaming, while the second indicated the sequential or developmental basis; and the two afforded means for marshalling the facts in logical order and perceiving previously obscure relations. Proceeding on the basis afforded by these discoveries, it became easy to trace the intellectual history of gaming as a manifestation of esthetic and sophic activities; to follow the early rise and extraordinary extension of the sortilegic factor, and its tardy recognition as an expression of chance; and to take note of the sluggish growth of skill to the point at which this factor became appreciably potent, and its rapid waxing thenceforward as the chance element waned. Fortunately for students, the earlier developmental stages are not completely lost in the mists of antiquity like those of certain other human activities, but are found in all their various steps and degrees among living peoples, as Director Culin's collections clearly show.

Long before the recognition of the dynamic and sequential bases of gaming, the attention of students was caught by similarities in the gaming devices of widely separated peoples, and these similarities were among the activital coincidences at first regarded as evidences of ancestral unity; but recent researches tend to clear up the confusion on this point. The extended comparisons indicate, indeed, that the games of higher culture are derived from those of lower culture, and either

elaborated or simplified as the case may be by combination, with the retention of desirable and the elimination of undesirable features; the comparative studies clearly indicate, too, that the more primitive games are indigenous or autochthonous with respect to their players, being (so far as can be determined) the product of spontaneous esthetic or sophic impulse directed by environmental suggestion and finally shaped by intelligence normal to the stage of cultural development in which the players rest. This is the view suggested by the arrangement of facts in *Chess and Playing-Cards* and evidently held by the author—though this is one of the cases in which the general view appears between lines rather than in explicit statement.

Readers of the book may be repelled and discouraged not only by the condensation and incomplete statement of relation proper to a catalogue, but by the curiously chaotic book-making—evidently due to the expansion of the original catalogue into a book. There are many manifestations of this chaos, which becomes especially conspicuous when the nominal and actual contents are compared. Half a dozen lines of the table of contents (including six out of a hundred and twenty-three apparently coördinate titles) are as follows:

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2. Gaming arrows. Kiowa Indians, Indian Territory.....	685
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In the body of the book the "Introduction" passes, without break, into what appears to be a subordinate side-title, which is, however, the principal title, "1. Nyout"; then follow two still less conspicuous side-titles relating to the Kiowa Indians; but under the second of these falls a center-title, followed by a long series of main and minor titles relating to the various gaming devices of the Amerinds, occupying a hundred and sixteen pages or two-fifths of the entire book (and by far the most important part to American readers), which is absolutely without reference in the list of contents! Next come two more inconspicuous side-titles, and under the second three lines pertaining to the subject indicated; then, without literary break or reference in the contents, over a dozen pages (with half a dozen most interesting plates) relating to the gaming devices recorded in the classics and to African and other games, again without reference in the list! This literary imperfection is a burden on the reader, a blemish on the publication, and a needless blight on the authorship, in that it goes far

toward reducing a scientific contribution of the first order to the level of a mere collection (albeit an important one) of scientific data. The defects are not of such character as to stand in the way of appreciation of the rich body of material brought together, or of the rational classification evidently resting in the mind of the author; yet they must lead readers to hope for a more systematic presentation, at an early day, from one who has done so much to raise the study of games to the plane of science.

W J MCGEE.

Explorations in the Far North. By FRANK RUSSELL. *Being the report of an expedition under the auspices of the University of Iowa during the years 1892, '93, and '94.* [Iowa City:] Published by the University, 1898. 8°, ix, 290 pp., ills., map.

This modest publication is the record of a remarkable exploration of Arctic America. Dr Russell (now of Harvard) set out in the interest of the State University of Iowa to make natural-history collections in the neighborhood of Great Slave lake, and thence northward to the shores of the Arctic; in carrying out his plan, he was brought in contact with the various Athapascan tribes, lived in their lodges, and otherwise suffered opportunities for making their intimate acquaintance. One of his hardest trips led him northeastward from Fort Rae across Coppermine river and nearly to Bathurst inlet, where he shot a number of musk-oxen and brought out their heads and skins by dint of incredible labor; then he undertook the unprecedented task of canoeing down Mackenzie river throughout its entire length and along the coast of the Arctic ocean from its mouth to Herschel island, in order to make connection with a fleet of whalers of which a rumor had come to him—and this essay, like the others of his unique expedition, was successfully accomplished. Half of his book is devoted to the itinerary; the other half comprises four chapters on ethnology, with an extended supplement on the natural history of the region traversed. The notes on the Athapascan tribes are of value, though most of the linguistic notes are withheld for future publication. A considerable collection of ethnologic material (now preserved in the State University of Iowa) was made, and is illustrated in the work, this material representing both Athapascan and Eskimo handicraft; and a chapter is devoted to the myths of the Cree Indians of the Woods. The author deplores the meagerness of his ethnographic notes and material; yet he has succeeded, in itinerary as well as in the special chapters, in presenting a remarkably clear and instructive picture of tribesmen engaged in bitter struggle against the most inhospitable environment of the North American continent.

W J MCGEE.

The Last Link. Our Present Knowledge of the Descent of Man. By ERNST HAECKEL (Jena). With Notes and Biographical Sketches by Hans Gadow. London: Adam and Charles Black, 1898. 16°, 4 ll., 156 pp.

This little book consists primarily of an address by the veteran evolutionist of Jena, delivered on August 26, 1898, at the Fourth International Congress of Zoölogy in Cambridge, under the title "On our Present Knowledge of the Descent of Man." It is opened by an introduction apparently picturing present opinion on the general subject of evolution in Europe, especially on the continent; and, in view of the eminent abilities of the author and his fame as a leading exponent of evolutionary doctrine abroad, it may be worth while for American students to glance back at the leading lines of a picture which recalls conditions existing in this country about a generation ago:

During the forty years which have elapsed since Darwin's first publication of his theories an enormous literature, discussing the *general problems* of transformism as well as its special application to man, has been published. In spite of the wide divergence of the different views, all agree in one main point: the natural development of man cannot be separated from general transformism. There are only two possibilities. Either all the various species of animals and plants have been created independently by supernatural forces (and in this case the creation of man also is a miracle), or the species have been produced in a natural way by transmutation, by adaptation, and progressive heredity (and in this case man also is descended from other vertebrates, and immediately from a series of primates). We are absolutely convinced that only the latter theory is fully scientific. To prove its truth, we have to examine critically the strength of the different arguments claimed for it. (Page 7.)

Proceeding on this platform, which is surprising only in the naive assumption that it remains necessary at this end of the century, Haeckel develops his argument on lines similar to those pursued by Huxley in "Man's Place in Nature," with full reference to recently-discovered facts, especially those connected with the fossil *Pithecanthropus erectus* found in Java in 1894 by Dr Eugène Dubois; this discovery forming the motive for the discussion as well as for its title. Throughout, the genus *Homo* is regarded from the standpoint of the zoölogist alone, with no recognition of the collective and intellectual characteristics which most strongly demark man from the lower animals, and the ascent is regarded as following a single line from Lemures through Simiæ, Platyrrhinæ, Catarrhinæ, and Anthropidæ, with no distinction between the tailed line and that tailless line whence *Homo* must have sprung.

The phylogenetic tables and diagrams are mainly from the author's *Systematische Phylogenie der Vertebraten*.

The biographical sketches (of Lamarck, Saint-Hilaire, Cuvier, Baer Mueller, Virchow, Cope, Koelliker, Gegenbaur, and Haeckel) and Dr Gadow's notes on the "Theory of Cells," "Factors of Evolution," and "Geological Time and Evolution" occupy half the little volume. The last of these notes evinces a strong disposition to reduce geologic time, so far as may be, toward the orthodox chronologies represented by that of Archbishop Ussher, thus reflecting the state of opinion indicated in the introduction; and this tendency finds even more explicit utterance in the tabulation of the course of ascent from the anthropoid apes through *Pithecanthropus erectus* and the man of the reindeer epoch to "Adam and Eve."

The book is well printed in large type, on good paper, and neatly bound.

W J MCGEE.

The Story of the British Race. By JOHN MUNRO. New York: D. Appleton & Company, 1899. 16°, 228 pp.

This recent addition to Appleton's "Library of Useful Stories" must attract readers desiring some brief yet trustworthy account of a world-shaping people. Beginning with a somewhat comprehensive introduction, the author passes to a definition of the European race, and thence to a description of the pioneers of Britain based on archeologic and historical records jointly; next he discusses the English and Welsh people and characterizes their types, and then gives similar treatment to the Scotch and Irish; the book ends with two chapters devoted, respectively, to "The Celtic Fringe" and "The Celtic Renaissance." In general, the work may be considered an abstract of the voluminous literature of a people who have inspired much writing, shaped by the effort to rectify history and pure literature in the light of physical anthropology; comparatively little attention is given to activital characteristics, or to that convergence of culture and blending of blood so conspicuously displayed by the vigorous peoples of the British Isles. The work contains no original contributions to knowledge, yet is a convenient summary of existing knowledge. The tone of the book is curiously pugnacious, and more arrogant than might reasonably be expected even from a recognized authority in anthropology; the preface is a challenge to historians and teachers, and later philologists, littérateurs, archeologists, and even anthropologists in general are freely flouted; so that the style would seem controversial, did not the adversaries change with the pages and eventually include nearly all contributors to the subject. The persistent pugnacity is incongruous in a

treatise designed for general reading, though the less surprising in view of the author's equally persistent magnification of the glories and beauties of the Celt. The little book is neatly printed, and illustrated with four somatologic maps, but is without an index.

The History of Mankind. By Professor FRIEDRICH RATZEL. Translated from the second German edition by A. J. Butler, M. A. Volume III. London: Macmillan and Co., Limited. New York: The Macmillan Company, 1898. Roy. 8°, xiii, 599 pp., ills.

So much has already been said in commendation of the first two volumes of Butler's translation of Ratzel's work that it seems almost unnecessary to comment on the third volume, which, published late in 1898, crowns the success of a noteworthy undertaking. As a reference work to the anthropologist, in whatever special field his attention may be directed, and as a series of great text-books to the English-reading layman interested in the Science of Man, this improved English edition of Ratzel's *Völkerkunde* is of pronounced value. It takes the place of numerous works of similar scope that have appeared during the last half-century, but which have become inadequate by reason of the strides which Anthropology has made during that period. The third volume continues the treatment, in ample manner, of the negro races (the Africans of the interior and the West Africans), as well as of the cultured races of the Old World. The mechanical excellence of the previous volumes is maintained throughout volume III, which is illustrated with two colored maps, eleven colored plates, and two hundred and sixty-seven other illustrations—all essential to the elucidation of the text of a work of this kind, and all beautifully reproduced. A copious index of the work (twenty pages) and an index of all the illustrations in the series (ten pages) complete the volume.

F. W. HODGE.

Ruins of the Saga Time: Being an Account of Travels and Explorations in Iceland in the Summer of 1895, by THORSTEINN ERLINGSSON, on behalf of Miss Cornelia Horsford, Cambridge, U. S. A. With an introduction by F. T. Norris and Jón Stefánsson, Ph.D., and a résumé, in French, by E. D. Grand. London: David Nutt, 1899. 8°, 112 pp., ills., map.

In 1895 Miss Cornelia Horsford of Cambridge, Massachusetts, commissioned Dr Valtýr Guðmundsson, Professor of the University of Copenhagen, and an Iclander by birth, to select a man of ability for the archeologic exploration of Iceland, in order to obtain definite answers to a series of questions formulated by her. These answers are

expected to shed light on the origin of certain antiquarian remains now existing on Charles river, Mass., and elsewhere in America. Dr Guðmundsson is the author of a standard work on the subject, bearing the title *House Building in Iceland in Saga Times* (1898). As the head of the exploring party he selected Thorsteinn Erlingsson, who started from Copenhagen on June 1st and arrived at Reykjavík on the 11th, whence he started for the eastern districts of the island, where traveling is extremely difficult from want of good roads and owing to the lack of transportation facilities and the severity of the weather. After examining over 218 ruins, Erlingsson returned to Reykjavík on October 1st. The remains which he visited and excavated were found to be of intense interest, for many of them are over four hundred years old, and consist of long and square houses, hillside cots with pavements, mounds, *things* (open-air law-courts), and doom rings, irrigation and drainage ditches, river dams, *hithes* (harbors), shipdocks or *nausts*, grave-hills, farms, and forts. Photographing was made quite difficult owing to wind and rain; nevertheless the photographic illustrations in the volume give excellent representations of most of the objects observed and studied. It seems that from Mr Grand's résumé in French many things can be better understood than from the English rendering of the Danish original. A large map and three indexes are subjoined and make reference easy. The method adopted by Miss Horsford for comparing the antiquarian remains in New England with similar structures in Iceland, the home of the Norse discoverers of Vineland, is most praiseworthy. The present work supplements that undertaken by Miss Horsford's father, the late Prof. Eben Norton Horsford, as well as her own investigations which have borne fruit in a paper published in the *National Geographic Magazine* (1898, pp. 73-84) under the title *Dwellings of the Saga Time in Greenland, Iceland, and Vineland*. In this paper the "Saga time" of Scandinavia is estimated to begin about 875 A.D., and to end about 150 years later, for this is the period of the discovery, colonization, and early history of Iceland as well as of Scandinavia.

A. S. GATSCHE.

Hondureñismos. Vocabulario de los provincialismos de Honduras. Por ALBERTO MEMBREÑO. Segunda edición corregida y aumentada. Tegucigalpa: 1897. 8°, xiv, 269 pp.

The limited acquaintance which those of the outside world have of Honduras, its history, culture, and languages, makes acceptable any contribution that is likely to render knowledge concerning its interesting and diversified population. Among the two thousand words

gathered by Dr Membreño in the above-titled work, there are found Spanish terms used with significations differing from those of classic Spanish; others are of Indian, especially Nahuatl, origin, or dialectal terms now of unknown derivation. The author often illustrates the meanings of peculiar words by presenting sentences in which they occur; and from the number of collaborators mentioned it is apparent that the people of Honduras are taking deep interest in researches of this description. The appendix to the volume is devoted to vocabularies, each of 250 to 400 terms, of the following Indian stock languages spoken within the confines of the republic: Moreno or Carib, Zambo or Misquito, Sumo or Woolwa, Paya, Jicaque, Lenco, and Chorti. While Chorti belongs to the Maya family, Carib originally was South American and West Indian; and Zambo, better known to Americans as Misquito, has its principal domain in eastern Nicaragua. Of the Paya no vocabulary had ever been printed prior to the present work consequently Membreño's publication, so far at least as Indian linguistics are concerned, comes as a highly agreeable surprise.

A. S. GATSCHET

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NOTES AND NEWS

Amerind: A Designation for the Aboriginal Tribes of the American Hemisphere—A part of the proceedings of the Anthropological Society of Washington, at a meeting on May 23d last, seems destined to produce permanent influence on ethnologic nomenclature; this part of the proceedings taking the form of a symposium on the name of the native American tribes. The discussion was opened by Col. F. F. Hilder, of the Bureau of American Ethnology, with a critical account of the origin of the misnomer "Indian," applied by Columbus to the American aborigines (see page 545 herein); he was followed by Maj. J. W. Powell who advocated the substitution of the name *Amerind* recently suggested in a conference with lexicographers. A communication by Dr O. T. Mason followed, in which the various schemes of ethnologic classification and nomenclature were summarized and discussed. Contributions to the symposium were made also by Dr Albert S. Gatschet, Dr Thomas Wilson, and Miss Alice C. Fletcher. At the close of the discussion the contributions were summarized (by President McGee) as follows:

1. There is no satisfactory denotive term in use to designate the native American tribes. Most biologists and many ethnologists employ the term "American"; but this term is inappropriate, in that it connotes, and is commonly used for, the present predominantly Caucasian population. The term "Indian" is used in popular speech and writing and to a slight extent in ethnologic literature; but it is seriously objectionable in that it perpetuates an error, and for the further reason that it connotes, and so confuses, distinct peoples. Various descriptive or connotive terms are also in use, such as "North American savages," "Red Men," etc; but these designations are often misleading, and never adapted to convenient employment in a denotive way.

2. In most cases the classifications on which current nomenclature are based, and many terms depending on them for definition, are obsolete; and the retention of the unsuitable nomenclature of the past tends to perpetuate misleading classifications.

3. While the name "Indian" is firmly fixed in American literature and speech, and must long retain its current meaning (at least as a synonym), the need of scientific students for a definite designation is

such that any suitable term acceptable to ethnologists may be expected to come into use with considerable rapidity. In this, as in other respects, the body of working specialists form the court of last appeal; and it cannot be doubted that their decision will eventually be adopted by thinkers along other lines.

4. As the most active students of the native American tribes, it would seem to be incumbent on American ethnologists to propose a general designation for these tribes.

5. In view of these and other considerations, the name *Amerind* is commended to the consideration of American and foreign students of tribes and peoples. The term is an arbitrary compound of the leading syllables of the frequently-used phrase "American Indian"; it thus carries a connotive or associative element which will serve explicative and mnemonic function in early use, yet must tend to disappear as the name becomes denotive through habitual use.

6. The proposed term carries no implication of classific relation, raises no mooted question concerning the origin or distribution of races, and perpetuates no obsolete ideas; so far as the facts and theories of ethnology are concerned, it is purely denotive.

7. The proposed term is sufficiently brief and euphonious for all practical purposes, not only in the English but in the prevailing languages of continental Europe; and it may readily be pluralized in these languages, in accordance with their respective rules, without losing its distinctive sematic character. Moreover, it lends itself readily to adjectival termination in two forms (a desideratum in widely-used ethnologic terms, as experience has shown), viz.: *Amerindian* and *Amerindic*, and is susceptible, also, of adverbial termination, while it can readily be used in the requisite actional form, *Amerindize*, or in relational forms, such as *post-Amerindian*, etc.: the affixes being, of course, modifiable according to the rules of the different languages in which the term may be used.

8. The term is proposed as a designation for all of the aboriginal tribes of the American continent and adjacent islands, including the Eskimo.

The working ethnologists in the Society were practically unanimous in approving the term for tentative adoption, and for commendation to fellow students in this and other countries.

Amerindian Arrow Feathering—The archeologist is interested in the material and form of the arrowhead, since all other parts of arrows are made of the most perishable material,—sinew, feathers, and soft wood or reed. Among the parts of aboriginal tools which pass

away by time, there are none so evanescent as the portions of arrows of which I have just spoken. Aside from the stone head, the perishable members of the arrow furnish excellent data for the study of technology, ethnography, geographic distribution, and mythology.

In this brief note attention is called simply to the feathering of arrows by the Amerinds. The characteristics subject to modification in the feathering are the feathers themselves, studied as to the number, the question of whole or half feathers, and the method of attachment; the portion of the shaft to which the feathers are attached, and the treatment of the notch. All over the interior of Canada and the United States, and in certain portions of South America, three half-feathers are set on radially. They are usually tied at their ends to the shaft and, in addition to this, the midrib is glued to the arrowshaft, but there are certain restricted areas where these half-featherings are attached to the shaft by a continued sewing. I have seen a few examples of these in southwestern United States; it exists also in eastern Peru and on the headwaters of the Amazon. On Xingu river the half-feathers are sewed to the wood of the shaft itself at certain points, but this seems to be quite local. The other form of administering the feather is to lay flat two whole feathers on the shaftment or inner end of the arrow, usually with the underside of the feather outward. The Eskimo attach these to the soft wood of the shaft by punching holes in the latter and inserting the ends of the feathers in these holes. Lashing is also added at both ends of the feathers. Whether or not through influences from without, since the occupancy of the whites, this form of two feathers laid on flat is not universal among the Eskimo, but exists only in the out-of-the-way and unsophisticated regions. It may be called, however, an Eskimo method of feathering. The flat shaftment and the peculiar release lend themselves to this sort of administration.

Passing down the Pacific coast to northwestern Washington among the Salishan tribes, we encounter again this form of feathering, wherein two whole feathers are attached to the soft cedar arrowshaft by lashings of bark. All the California arrows have three half-feathers set on radially, and in some of them there is a decided spiral in the application; but around the mouth of Colorado river and in the mountain region of Mexico, below the boundary line, the two flat feathers occur again. They are found also among the Lacandonese of southeastern Mexico.

In Hermann Meyer's *Bows and Arrows in Central Brazil* the two feathers laid on flat occur again, and, from the drawing, seem to be set so that the underside of the feather is outside on the lashing. I am especially interested, therefore, in getting at the correct geographic dis-

tribution among the Amerinds of two feathers laid on flat in arrow feathering. Wherever I have seen any of this type, they are so little affected by contact that I have come to suspect a wider distribution of this form of feathering before the advent of the whites. Indeed, if the reader will look at any collection of arrows received from the plains of the Great West, he will find that the feather end of the shaft has all the appearance of having been made by machinery. The question of independent invention may also arise in this connection, since, as some of my colleagues would have it, whenever you see a tribe using any particular form of technique, that is an evidence of their own originality—the idea of contact between tribes not being evidenced in the slightest degree by the identity of their implements and art products.

O. T. MASON.

How the Amerind Bored a Long Hole in Wood—A distinguished historian of engineering said to the writer only recently: "The archeologists have made it plain to me how the primitive peoples chipped silicious stone; how they 'bushed' or hammered friable stone; how they drilled short holes through stone, ivory, and other hard materials by double cone; how they sawed, whittled, and chopped; but I cannot even imagine how the Amerind or other savages bored a long hole in wood to make pipestems, etc." The answer to this inquiry is easy. In the tropical region, especially of South America, there grow reeds of great length between the joints, so that the natives of British Guiana and elsewhere could make their blow-tubes of a single joint. These were inserted into a cylinder of palm wood and straightened by making one end fast up in a tree and weighting the other end with a heavy stone suspended until the wood was thoroughly seasoned; after that the tube would not warp or bend.

In the subtropical areas reeds have shorter joints, but they and many other plants have soft pith which is easily removed by means of a hard rod. There is no difficulty in these examples because Nature has furnished the auger; but on the plains of the Great West, along the great lakes, on the cedar-producing portions of the North Pacific coast, and, indeed, in certain portions of tropical America, a long tube was formed by splitting the stick from end to end, gouging half cavities from the interior of each piece, and then uniting the halves by means of gum and lashing of wet material, which, shrinking, made the whole as solid as ever. So, the pipestem, the lover's flute, the rattle, the inverted reed instrument, and even blow-tubes for arrows with bore ten feet long have been excavated in this way. After the cavity is formed it is easy enough to make it smooth and uniform by pulling,

backward and forward, a rod on which sand has been gummed. Here we have another example of the easy way in which the savage attains his end, and the great difficulty which the modern ethnographer experiences in trying to find the paternity of our intricate apparatus of steel and iron.

O. T. MASON.

The Adopted Indian Word "Poquosin"—In an article in the January number of this journal on *The Adopted Algonquian Term "Poquosin,"* Mr Tooker, referring to a communication of mine to the *New York Sun* of June 30, 1895, in which I stated that the word *poquoson* apparently meant "place where there is little water," remarks: "This is a very good guess, for . . . there is something 'little' in the word, but not water." In ascribing to the word the meaning quoted, I intended merely to give its general sense, that being amply sufficient for the purposes of a popular article contributed to an ephemeral publication. There is in the word, it is true, no particle signifying "water," nor is there, on the other hand, as Mr Tooker supposes, any diminutive sign giving the sense of "little"; yet both terms, "little" and "water," are implied in the root, which is: *pdkw* (Lenape, Cree, Abnaki); *pákw* (Massachusetts); *bákw* (Ojibwa), "to contain but little water," "to be shallow," "to be dryish." *Poquoson* or *poquosin*, for *pákwusin* or *pákwesin*, has the form of, and is, an inanimate verbal adjective. Adjectives of this class in *-sin* (*si* + *n*) are derived from inanimate transitive verbs of the conjugation in *-ton*, in which the sign *si*, when used before the verbal suffix, denotes that the subject "puts," "lays," "places," or "arranges" the object in the manner or condition signified by the root. They have, naturally, a passive sense, and denote that the object which they qualify is laid, put, placed, situated, or located in a certain manner, condition, or position as the result of some action that it has suffered. *Poquosin* (*pákwesin*) means "it is low-watered," "it is rendered somewhat dry," through the effect of some action, such as drainage, absorption, or evaporation. This agrees perfectly with the definition of *poquosin*: low, wooded ground or swamp, mostly dry in summer, and covered with water in winter.

The *pokelogan* mentioned by Mr Tooker is a different word. Among the lumbermen of Maine it designates an inlet that extends into the land from a stream or lake—a sort of blind ditch that leads nowhere. Thoreau's Indian guide pronounced the word *ipokelogan*, and, when asked its meaning, replied that there was "no Indian in 'em." This is very true, for the word, as spelled, is unintelligible. It is probably a corruption of *pukdlagat*, "open ditch."

As Mr Tooker attempts to connect the name Poughkeepsie with the

word *pequosin*, and confidently asserts that "there appears to be absolutely no question as to its identity" with the latter, it may not be out of place to explain the meaning of the appellation of the city of the alleged "safe harbor." Having resided in Poughkeepsie many years, I am perfectly familiar with its topography and with the exact locality to which the name was originally applied. This was a rocky cove or basin worn away at the foot of the fall near the river just north of the present railroad station. On May 5, 1683, Massany, a Highland (west side of the Hudson) Indian, gave as a present to one Jan Smeedes, a farm and also "a fall on the shore to set a mill upon." Smeedes erected his mill upon the side of the pool or basin near the foot of the fall whence he obtained his water power. In the deed of gift, the Dutch scribe wrote the name of the mill-site *Poughkepesingh* (or *Apoeghkipisingh*), a word which, in German orthography, would have been *Apuchkipisink*. The word means "at the rock pool," or "at the rock basin of water," and accurately described the locality to which the name was applied by its Indian owner.

The name of the place under consideration was distorted by the Dutch and their descendants into so many remarkable and unintelligible forms as amply to justify the remark once made by the late Dr Trumbull that "nothing disguises an Indian word so effectually as a Dutch pen."

W. R. GERARD.

An Inverted Double Reed—In the National Museum there are several wind instruments of music of the class here called "inverted double reed" which, with one exception, are in use only among the Coast tribes of British Columbia, and I do not find that any writer on musical instruments has called attention to them. To make the construction plain, let us divide reed instruments into three classes: (1), the ribbon reed, fastened at both ends and vibrating at the middle, as when one blows on a blade of grass held between the thumbs; (2), the single reed, fastened at one end and swinging free in its slot or beating against the edges of the instrument; and (3), the double reed, having two vibrating bodies instead of one. In the third class the breath is forced between the reeds. In the ordinary double reed, the free ends are toward the player's mouth, and they do not quite touch each other. The pressure of the breath brings the vibrating ends together, and the sound is produced by waves in the space beyond. But, in the British Columbia specimens, which Professor Mason has named the "inverted double reed," the free ends are away from the mouth of the player, are close together when at rest, and are forced apart by the breath of the player. Number 89060 is from the Bella Bella (Salishan) Indians. It

is a bit of cedar shaped like an elongated Indian club flattened at the thick end. The wood has been split and the large part or outer ends excavated to form thin, spoon-shape sections; the smaller or inner ends have only little channels cut in them for an air passage; the two halves are then lashed together with split-spruce root at the inner end and at the point where the widening out begins; the outer ends are left free. When the breath is forced in at the mouth-piece it causes the free ends both to open and close and to produce a harsh sound. There are in the Museum examples of this class also from the Skiddegate Indians of Queen Charlotte islands.

The Massets of the same locality improve on this in an instrument with longer chamber and thinner walls, and the two halves are lashed in three places instead of two, namely, at the ends and just above the chamber or enlarged cavity. The action, therefore, is more like that of a "double ribbon reed." By holding the tube between the fingers at different points between the lashings, distinct tones can be produced.

The only other specimen of this variety of reed instrument in the National Museum is from Fez and is called *lira* (number 95762). It is a short joint of cane with mouth-piece at the open end. The jointed end is split and the parts set in vibration by the breath produce a reedy musical sound.

All of the North Pacific specimens are excavated by splitting and hollowing a bit of soft wood, Indian fashion, after the manner of the flageolets of the plains tribes.

I shall be grateful for any reference to a wider distribution of the "inverted double reed."

E. H. HAWLEY.

U. S. National Museum.

Cabot on the American Natives, 1497-1508—John Cabot, the English discoverer of America, sailed from Bristol, England, in May, 1497, in command of a little vessel carrying eighteen men. Steering westward, he came to land on June 24, somewhere on the coast of North America between Halifax and the straits of Belle Isle, most probably at or about Cape Breton island. Six weeks later he had returned to England, where his reports, confirmed by the stories of his shipmates, created much excitement. One of those who listened to the account of his adventures was Lorenzo Pasqualigo, a Venetian fellow citizen of the Cabots. Pasqualigo was in the habit of writing long newsletters to his brothers in Italy, and one of these, which has fortunately been preserved to our time, is dated August 23, 1497, less than a fortnight after Cabot's return to London. In it Pasqualigo gives an

account of what he had learned about the latest western discovery. Among other things, he reports that Cabot "landed, and although he saw no human beings, he has brought back to the King some snares which had been set to catch game, and a needle for making nets. He also found some felled trees. Wherefore he supposed that there were inhabitants, and returned to his ship in alarm."

These statements are confirmed in a dispatch sent to the Duke of Milan in the following December, in which his diplomatic representative at London, Raimondo di Soncino, gave him an extended account of Cabot, his discovery, and future plans. Neither this nor any of the other early documents, however, add any information regarding the unseen natives. Such as it is, the evidence seems to prove that Cabot found land in the west, went ashore and took formal possession of the territory on behalf of his royal patron, Henry VII of England, looked about, and then hurried away as quickly as possible to carry the news of his success to England. He doubtless utilized the opportunity to refill his water-casks, but there is no reason to suppose that he spent more than a few hours on American soil during his first visit to this continent.

In the spring of 1498, John Cabot again started for the New World. There is, however, no evidence that he ever reached his destination, and none to prove that he succeeded in returning to Europe. Three or four years later, some Bristol merchants fitted out an expedition which made a voyage to America, and it is quite possible that Cabot's son Sebastian may have taken part in this venture. From the very scanty records which survive we learn that in 1502 there "were brought unto the King [Henry VII] three men taken in the New found Island (by Sebastian Gabato). . . . These men were clothed in Beasts skins, and did eate rawe Fleshe, and spake such speech, that no man could understand them, and in their demeanor like to brute beasts, . . . of the which three men, two of them were seene in the Kings Court at Westminster two yeares after, appparelled like Englishmen, and could not be discerned from Englishmen, but as for speech, I heard none of them utter one word."¹

In one of the legends which accompany the famous Cabot *mappe-monde* of 1544, there is a reference to the American aborigines. Whether written by Sebastian Cabot or not, the information contained in this legend must almost certainly have come from him directly. Referring to Labrador, this eighth legend states that "the people there go about clothed in the skins of animals. In their wars they use bows and

¹ Hakluyt, *Principall Navigations*, 1589, p. 515.

arrows, lances, darts and a sort of wooden clubs, and slings. It is a very sterile land." Cabot probably obtained this information during the voyage which he made into the Arctic regions in 1508-9. In one of the accounts of that voyage, written by Cabot's intimate friend Peter Martyr before 1515, it is stated that Cabot landed and found the people "covered with the skins of beasts, yet not without intelligence."

Unsatisfactory as these scanty references seem, when contrasted with the elaborated notebooks of modern ethnological field students, they are nevertheless interesting and deserving of note as the earliest surviving records of the natives of British America.

GEORGE PARKER WINSHIP.

Field Columbian Museum—The Report of the Field Columbian Museum for 1897-98 displays the usual activity of that institution along the lines of anthropologic research. During the year the Museum received its third consignment of objects from the Eskimo of Port Clarence, bringing the total number of specimens in the Alaskan collection above ten thousand objects. Dr G. A. Dorsey and Mr F. B. Melville visited Tusayan, Arizona, in January, 1898, where a number of casts of living subjects were made, and a small collection of ethnologic objects, to augment those previously deposited in the Museum, was obtained. While in the Tusayan country, the prehistoric pueblo of Homolobi, near Winslow, to which Dr J. Walter Fewkes had already devoted considerable attention, was visited and excavated, a hundred specimens of pottery, besides a number of stone implements and fetishes, being found. Advantage was taken of a visit to Chicago by a delegation of Eskimo, plaster casts of nine of whom were made. During the year the sum of \$1272.10 was expended for anthropologic objects; 41,989 catalogue cards of anthropologic specimens were prepared, and 79 negatives, 224 prints, and 112 lantern slides were made. The library of the section of anthropology seems insignificant, as it numbers only 124 books and 45 pamphlets; but the high character of the Field Columbian Museum publications will doubtless soon result in establishing a good working library of anthropology through the medium of exchange. The general library of the Museum contains 9003 books and 9630 pamphlets—a creditable showing for an institution so recently founded.

F. W. HODGE.

Manning Ferguson Force—Among men not specially devoted to a scientific or professional career, who have yet made notable contributions to scientific literature, we may justly rank the late General Manning F. Force, of Ohio. Born in Washington, D. C., Dec. 17,

1824, he died at Sandusky, Ohio, May 8, 1899. His father, Gen. Peter Force (born 1790, died 1868), Mayor of Washington City, was a lifelong historical student, book-collector, and editor, whose nine folio volumes, *The American Archives*, devoted to our Revolutionary history, are his best and most permanent monument. The Force family were of French Huguenot descent, and distinguished for patriotic devotion to principle.

Manning F. Force had the good fortune to receive his early education in the classical school founded at Alexandria, Va., by Benjamin Hallowell, that distinguished scholar and leader in the Society of Friends. He entered Harvard College at seventeen, graduating in 1845 and from the Law School in 1848, and settled in Cincinnati in 1849, where he practised law as a member of the firm of Walker, Kebler, & Force until 1861. He was a prominent member of the Cincinnati Literary Club, to which belonged Salmon P. Chase, Stanley Matthews, M. D. Conway, Murat Halstead, Charles P. James, A. R. Spofford, and others, and which celebrates the half-century of its existence the present year. To this society he contributed some of those scientific and historical essays of marked value, which have since been published.

Early in 1861 he enlisted in the Union army as lieutenant-colonel of an Ohio regiment, served bravely at Fort Donelson and Pittsburg Landing, marched with Sherman in Georgia, was severely wounded, but returned promptly to the front, was promoted to be a colonel and brigadier-general, and received a major-general's brevet "for especial gallantry before Atlanta."

Returning to Cincinnati, General Force was elected a Judge of Common Pleas in 1867, and reelected in 1871. In 1877 he was chosen Judge of the Superior Court of Cincinnati, and reelected to the same high office in 1882. Among other honors which came to him, he was President of the Historical and Philosophical Society of Ohio, member of many historical and scientific societies, and professor in the Cincinnati Law College. When declining health compelled him to withdraw from arduous judicial labors, he was appointed commandant of the Ohio Soldiers' and Sailors' Home, at Sandusky, an office which he held until his death. Always high-minded and chivalrous, he had a contemplative bent, and a certain coolness of temperament, free from that ardor which often outruns the judgment. The bibliography of General Force's writings includes the following, besides other papers which cannot here be enumerated:

"The Scholar; an Address at Kenyon College" (1855). "Pre-historic Man: the Primitive Inhabitants of Western Europe" (1868).

"Darwinism and Deity" (1872). "Some Considerations on the Mound Builders" (1873). "Some Early Notices of the Indians of Ohio. To what Race did the Mound Builders Belong?" (1879); also in French (1878). "From Fort Henry to Corinth" (Campaigns of the Civil War, vol. 2, 1881). "Attempts to Find a North-west Passage" (*North American Review*, 1849). "Sir John Franklin and the Arctic Regions" (*North American Review*, 1850). "The Life of Blennerhassett" (*North American Review*, 1851). "Great Commanders: General Sherman" (1899). He also edited new editions of Walker's "American Law," and of Harris's "Criminal Law."

The scientific and historical writings of General Force exhibit the ripe fruits of a carefully trained mind. Far from voluminous, they are all marked by comprehensive, yet condensed statement. On every page we find traces of wide research in assembling authorities, careful analysis, and cautious judgment in forming conclusions. The calm, judicial temper which gives due weight to every argument and fact, leaving no element unconsidered, is always apparent. The spirit of the partisan never obtrudes, but all yields to the spirit of investigation. We find perspicuous statement, acute discrimination, and rare precision in the use of language. These are merits of the first magnitude; and we cannot help regretting, as we read, that a writer so gifted with the qualities which might produce works of enduring value in the field of science, should have been absorbed through a long and busy life in unscientific pursuits. None the less, but the more to his credit, is it, that he turned, amid the engrossing labors of the bar, the bench, and the field, to the investigation of historical themes and the unsolved problems of the world we live in.

Not the least among the studies of anthropological subjects from the pen of General Force was his repeatedly printed monograph on the Moundbuilders of the West. In this he considers the various conjectures brought forward, in the absence of authentic history or tradition, to account for the existence of these remarkable remains.

A. R. SPOFFORD.

A Texas Indian Myth—It is remarkable that historians who have described most of the southern and southwestern Indians of the United States have neglected a tribe or group of tribes in every respect worthy of special notice on account of their friendship for the white man and their general good character. In fact, the only connected narrative relating to the Texas Indians that I have seen is in a paper by Mrs Lee C. Harby, published in the *Annual Report* of the American Historical Association for 1894.

In an unpublished Spanish manuscript, *Historia de Texas*, to which no author's name is attached, but which was evidently written by a Franciscan friar about the year 1781, are found some curious details respecting the Texas Indians. From this manuscript I have translated the following interesting myth describing the origin of a supreme being said to have been recognized by them :

"In the whole nation of the Tsinais, or Texas, as they are now called, is comprised, under the same language, more than fourteen or fifteen subdivisions, holding belief in the existence of a great chief who lives in the sky, whom they all call the same, *Caddi-Aye*, that is to say, the chief of above or on high, and to whom they attribute the creation of human beings, although (their tradition being full of contradictions) they suppose them to have existed before the origin of their creator, which they relate in the following manner :

"In the beginning of the world there was only one woman, who had two daughters ; one of these was a maiden and the other was pregnant. (It did not embarrass them that they had no account of a man by whom the mother and daughter could have become pregnant.) One day when the two girls were alone, and the pregnant one was lying in the lap of the maiden, the former was taken away by a strange event. It so happened that suddenly there appeared before them the *Caddaja*, or Devil, in the form of a gigantic man, of ferocious aspect, and with his forehead adorned with horns so enormous that their points were lost to view. At the moment when he showed himself to them, he seized the pregnant girl and tore her in pieces with his claws and quickly devoured her. The maiden, fleeing from a similar fate, availed herself of this interval and climbed to the top of a great tree. The hunger of the devil not being satisfied by having swallowed one girl, he sought the other to give her the same doom. Having seen her among the branches, he tried to climb them, but was not able, and without observing that he could knock her off with his horns, he applied his claws and teeth to cut the tree off at the roots so as to capture her. The maiden being in this sad perplexity, and no other means of escape offering itself, she plunged precipitately into a deep stream that ran near by. This did not cause the *Caddaja* to despair of capturing her, and to accomplish it he commenced to drink the water in order to exhaust the stream and leave it dry, so as to offer to his voracity this second victim ; but swimming between wind and water the maiden mocked his cunning and escaped the danger by leaving that spot and reaching land at her own place, where she found her mother, to whom she related the tragic end of her sister. Together the two started immediately to the place of the misfortune, and the mother, examining the trail of blood of her massacred child, found one drop within the cup of an acorn. She took it up with care and covered it with another cup from the same fruit, then warmed it in her bosom and took it to her hut. She put it in a small earthen vessel, and when it was tightly closed she placed it in a sheltered corner of the room in which she slept. That night she heard within the vessel a noise like a light tapping or scratching. As soon as it was daylight she went to examine it and found that from the drop of blood there was formed a male child, very well shaped and handsome, but so small that its size did not exceed that of a finger of the hand. She was astonished at such a miraculous occurrence, and to insure her good fortune she closed the vessel again with great care. The noise was repeated that night, and on examining the vessel the following day she found that the child had attained the stature of a full-grown man. The joy of the

grandmother was increased at the sight of such a beautiful grandson, and without loss of time she made a bow and a sufficient number of arrows, which she presented to him when she took him from the vessel. The newly born, who already spoke the language perfectly, asked at once for his mother. The grandmother informed him of her tragic end, without concealing the knowledge of the cruel author of this barbarous event. The youth, being angry, went out to find him in order to avenge such an unheard-of injury; he found him without much trouble, and struck him on the body with the point of the bow and threw him so far from him that up to the present time he has never again appeared. Having avenged the infamous death of his mother, he returned to the place where his grandmother and aunt were. He told them how melancholy it would be for all to live in a land where there would be visible a thousand objects that would remind them of the sad end of his mother, and that this memory would destroy all their pleasures. They were convinced by his reasoning, and accompanied him joyfully to heaven (or, as they say, to *Cuchav-aye*), where they all dwell, the youth possessing the universal government of the world.

"In this manner those Indians relate the history of the origin of the first of their divinities, whom they adore and to whom they dedicate religious ceremonies, attributing to him the distribution of rewards and punishments according to the works of each individual, although they never attribute to these so much evil intention that they may not be condoned by the performance of certain ceremonies."

F. F. HILDER.

Dialects of New Caledonia—At a meeting of the Royal Society of New South Wales on September 7, 1898, a communication by Mr Jules Bernier was read in which it was stated:

"No less than twenty dialects are distinguished in New Caledonia, which are grouped into the following main divisions: the Southern, inclusive of the Isle of Pines; the Central; the Northern; and those parts of the Loyalty Islands peopled by Melanesians. The first two are sharply separated from the latter by the absence of the article. The northern is characterized by a tendency to terminate in a consonant as shown by the place names, Belep, Hienghen, Wagap. A foreign aggressive Polynesian element can be detected intrusive upon the indigenous Melanesian. A marked feature in the New Caledonian language is its extreme simplicity, it is the most primitive Papuan speech. Even the roots are in a state of fluctuation and affect various forms. Any labial, or it may be any dental consonant, may be used by a native with a root vowel to express a particular word. The same word can be used as a noun, verb, or adjective, and the broad difference which elsewhere prevails between the parts of speech is here unknown. Monosyllabism prevails, and the roots have preserved a synthetic signification which seems a property of primitive people, but which is in more advanced languages obliterated by specialization. Thus the native mind aggregates together such ideas as white, bright, eye, sun, day, light, and expresses them by forms of a root word 'fire.' A method occurs by which not only verbs but other parts of speech are conjugated. Enumeration is of the usual Papuan type, counting by one, one-one, one-two, one-three, five equal a hand (in reference to the digits), five-one, five-two, five-three, five-four, ten equal a head."

White Russian Folk-music—In an interesting article on "The Folk-songs of White Russia," translated from the Bohemian of Ludvik

Kuba, by J. J. Kral, and published in *Music* for December, the author says :

"Instrumental folk-music among the White Russians there is almost none. Here and there you will find a lonely fiddler whom they call a *skripak* and who is of but little importance in musical ethnology. It seems that those sporadic fiddlers have accepted that instrument from the Poles, but they never possess the significance of the true Polish *skrzypki*. At times White Russia receives the visit of a wandering Polish Hebrew band with the cymbal or a Polish bagpipe. I have not found any musical instrument peculiar to White Russia, neither have I heard or read of any. One instrument only deserves mention, both for its extensive use and its deplorable effects. It is the accordion, which you are likely to meet at any time in the country districts of Russia. That instrument has a disastrous effect upon all that has grown up on the grounds of native popular musical art; it spoils the beauty of the native folk-songs as soon as the fortunate owner of that unfortunate instrument essays to reproduce them. The poorer White Russia appears to be in instrumental music, the richer and the more interesting it is in its songs. The old folks, it is true, are dying out, and the spirit of modern times (on its dark side) begins to gnaw upon the folk-song, still a rich harvest awaits the industrious hands of a collector. Alas, the workers are so few, almost none! The folk-songs of White Russia exhibit great variety in the text and their application. Mr V. N. Dobrovolsky, who has lately given special attention to White Russia, and gathered considerable material (still in manuscript), classifies them as songs of the Spring, Kupalo (St John's), Harvest, Ceremonial, Wedding, Historical, Rebellious, and Jewish songs. To these we must add the dance songs, or the *skatubkas* and choruses sung at festivals."

Native Tribes of Queensland—In the northwestern corner of Queensland, fronting the Gulf of Carpentaria and extending a long way inland, there are some aboriginal tribes whose organization is different from that of other communities in the colony mentioned. These tribes are divided into eight sections or classes, every one of which has a feminine equivalent, being the name of a brother and his sister in each section, as follows :

<i>Male</i>	<i>Female</i>
1. Kunuller	Nungallermer
2. Bongaringee	Nongarimmer
3. Burralangee	Nurralammer
4. Bullerringee	Nulyarramer
5. Bolangee	Nolangmar
6. Kommerangee	Nemurramer
7. Narrabalandee	Neonammer
8. Yakamurry	Jummeyunee

The eight sections here enumerated intermarry as follows :

1. Kunuller marries Nolangmar
2. Bongaringee marries Jummeyunee

3. Burralongee marries Neonammer
4. Bullerringee marries Nemurramer
5. Bolangee marries Nungallermer
6. Kommerangee marries Nulyarramer
7. Narrabalangee marries Nurralammer
8. Yakamurry marries Nongarimmer

The four first-mentioned sections form a group which may be called *A*, and the remaining four constitute group *B*. The sons of one group marry the daughters of the other, in a certain prescribed order, which is determined by the sectional names of the parties to the marriage, and the sections to which the offspring will belong are regulated in a similar manner. These rules will be elucidated by the accompanying table :

Group	Section of Parents		Section of Offspring	
	Fathers	Mothers	Sons	Daughters
<i>A</i>	Kunuller Bongaringee Burralongee Bullerringee	Nolangmar Jummeyunye Neonammer Nemurramer	Yakamurry Narrabalangee Kommerangee Bolangee	Jummeyunye Neonammer Nemurramer Nolangmar
<i>B</i>	Bolangee Kommerangee Narrabalangee Yakamurry	Nungallermer Nulyarramer Nurralammer Nongarimmer	Bullerringee Burralongee Bongaringee Kunuller	Nulyarramer Nurralammer Nongarimmer Nungallermer

It will be seen that the women determine the sections which constitute a group. For example, Nolangmar is the mother of Jummeyunye, Jummeyunye of Neonammer, Neonammer of Nemurramer, and Nemurramer of Nolangmar, the same name with which we started, and this order of succession is repeated *ad infinitum*. These four sections therefore form a group, called *A*.

If we take the women of the other four sections, it is found that they constitute another group, *B*, in precisely the same way. The women never change from the group to which they belong, but pass successively through each of the four sections in as many generations. It is also seen by the table that the sons of the women of one group marry the daughters of the women of the other; as already stated. The foregoing groups, *A* and *B*, are respectively equivalent to the groups marked *A* and *B* of the Warramonga tribe, reported by me to the Royal

Society of New South Wales last year,¹ although the names of the sections composing the groups are entirely different.

For the particulars from which I have prepared the tables given in this article, I am indebted chiefly to Mr R. H. Shadforth.

R. H. MATHEWS.

Sinew-working at Point Barrow—Sinew is used by Eskimo men and women of Point Barrow, Alaska, for making all sorts of thread, string, and heavy lines. It is taken from the neck, back, and shoulder-blades, as well as from the legs of the deer, then cleaned and soaked in water. When in straits, the Eskimo will use any sinew he can get. In summer time the back sinew is dried on a board until it falls off; in winter it is soaked and put on a block of ice to dry. That dried on the board is the better. The leg sinew is not spread on a board, but is merely hung up and dried for future occasion.

The back sinew is used for sewing, needle-work, etc. The women shred it as needed, stripping off a filament, drawing the end through the mouth, rolling it on the cheek or on the thigh, after the manner of a shoemaker with his waxed end, threading the needle with it.

The leg sinew is used for a great many purposes; it is first pounded and then shredded into the finest fiber and tied in bunches or hanks. It is plaited in the form of sennit for sewing together the skins that form the boat, and for sewing soles on boots. It is used also for cording watertight seams. They plait it into round sennit like a whip-lash, sometimes as much as eight- or sixteen-ply. A short piece plaited and rove through the hole in the harpoon head forms a four-ply line; then they form a loop, braiding all the eight strands together and making a line often many fathoms long by adding more filaments. For sewing water-proof clothing they use two-ply sinew thread, in making which the woman uses no other implement than her fingers. After twisting and laying up a few feet, she forms a ball which operates as a fly-wheel to twist the rest until she has a ball as large as her head. This twine is used for making fish-nets. Their nets originally came from the Hudson Bay Company.

CHARLES BROWER.

A Sokotra Expedition—In the *Bulletin* of the Liverpool Museums there has recently appeared a report of a biological and geographical expedition to the Island of Sokotra (in 12° north latitude and 54° east longitude), 600 miles southeastward from Aden, under the joint auspices of the British Museum and the Liverpool Museums. It was found that the true Sokoterians are only poorly civilized Mohammedans, living in caves or rude cyclopean huts, and possessing but few

¹ *Journal of the Royal Society of New South Wales*, vol. XXXII, p. 73.

utensils, implements, or ornaments, and no weapons. The ethnographical collection is consequently very small. Specimens of their pottery, of their primitive quern-like mills, of their basket-work, and of their weaving apparatus were, however, obtained, and also two large blocks of stone, inscribed with an ancient script, which may perhaps throw some light on the indigenes of the island in a past age, and of whose cyclopean remains photographs were obtained.

Dr Daniel G. Brinton, professor of American archeology and linguistics at the University of Pennsylvania, has presented to the University his collection of books and manuscripts relating to the aboriginal languages of North and South America. The collection represents a work of accumulation of twenty-five years, and embraces about 2000 volumes, in addition to nearly 200 volumes of bound and indexed pamphlets bearing on the ethnology of the American Indians. Many of the manuscripts are unique, while a number of the printed volumes are rare or unique and of considerable bibliographical importance. The collection of works on the hieroglyphic writings of the natives of this country embraces nearly every publication on the subject. The special feature of the library is that it covers the whole American field, North, Central, and South, and was formed for the special purpose of comparative study.

Deaths—**HENRY WILLIAM JACKSON**, at South Lincolnshire, England, on May 14th, aged 67 years; founder of the Lewisham and Blackheath Scientific Association, member of the Anthropological Institute of Great Britain and Ireland, and of the Société d'Anthropologie de Paris.

MANNING FERGUSON FORCE, at Sandusky, Ohio, on May 8th, aged 74 years. An extended notice appears elsewhere in this number.

The Anthropological Institute of Great Britain and Ireland was constituted in January, 1871, by the amalgamation of the Ethnological Society of London, which had been founded in 1843, and the Anthropological Society of London, established in 1863. Since the formation of the Institute, an illustrated *Journal* has been issued in quarterly numbers, forming, during the twenty-seven years of its existence, a series of as many volumes. Following precisely the size and shape of the publications of the preëxisting societies, the *Journal of the Anthropological Institute* has hitherto been a demy octavo; but this form has been deemed to be inconvenient, especially where papers have required illustration by means of ample plates and tables. With the view of obviating, so far as possible, this inconvenience, and also of improving

the general appearance of the *Journal* and bringing it into harmony with the important publications of some of the continental anthropological societies, the council of the Institute have commenced the publication of a new series of the *Journal* in imperial octavo form, of which the August-November number forms parts 1 and 2. Among the articles of special interest to American anthropologists are three by Prof. E. B. Tylor bearing the titles "On the totem-post from the Haida village of Masset, Queen Charlotte islands, now erected in the grounds of Fox Warren, near Weybridge"; "On two British Columbian house-posts with totemic carvings, in the Pitt-Rivers Museum, Oxford"; and "Remarks on totemism, with especial reference to some modern theories respecting it."

British Association—The President of the meeting of the British Association for the Advancement of Science, to be held at Dover, September 13th to 20th, will be Professor Michael Foster, while Mr C. H. Read of the British Museum will preside at the meetings of the section of Anthropology. The sum of fifteen hundred pounds has been subscribed toward a fund for the entertainment of the members, and an unusually successful meeting seems assured. Members of the Association Française pour l'Avancement des Sciences will visit Dover on September 16th, and the members of the British Association are invited to visit Boulogne on September 21st.

The American Museum of Natural History, New York city, proposes to publish under the title *Ethnographical Album of the North Pacific Coasts of America and Asia*, a selection of photographs collected by members of the Jesup North Pacific Expedition, provided a sufficient number of subscriptions can be obtained to warrant the undertaking. The photographs are to be reproduced by the heliotype process, in large quarto form. The edition will be limited to 250 copies. It is intended to issue the Album in parts of at least 24 plates annually, at six dollars a part, the whole series to embrace 120 plates. It is contemplated to publish during the first year a series illustrating Indian types from the interior of British Columbia.

Southern Arabian Ruins—The Imperial Academy of Sciences in Vienna has decided to dispatch an expedition to examine the extensive ruins of southern Arabia, particularly of Hadramut, and for this purpose has secured the coöperation of the Swedish Count Landberg, who is intimately acquainted with the country and its sheiks. He will be accompanied by Dr David H. Müller, Dr Alfred Jahn, Prof. Oskar Simony, Dr Franz Kossmat, and Dr Stephen Paulay.—*Deutsche Rundschau*, Jahrg. XXI, Heft 2.

Cameroon Dwarf People—The Bula expedition has brought back information about a dwarf people in the Hinterland of Cameroons. Their height varies from forty-nine to sixty-three inches; some of them plainly exhibit a mixture with other races, whereby their stature has been raised. These dwarfs are said to be skilful hunters, and diligent in collecting indiarubber which they sell to the neighboring tribes. They dwell in families, constantly wandering about in the thick forest, and carefully avoiding much frequented caravan routes.—*Deutsche Rundschau*, Jahrg. XXI, Heft 2.

MINOR NOTES

IT IS LEARNED from *Science* that arrangements have been made for the establishment of an anthropological museum at the University of Aberdeen. Several collections have already been presented to the University.

BAND I, HEFT I, of the *Zeitschrift für Morphologie und Anthropologie*, edited by Professor G. Schwalbe, has recently made its appearance at Stuttgart, Germany.

THE SAXONY GOVERNMENT is to erect a new museum building at Dresden, and the Director of the Museum, Dr A. B. Meyer, with the architect, Professor Wallot, will visit the United States this autumn for the purpose of studying the museum buildings of this country.

THE SOCIÉTÉ SCIENTIFIQUE DE CHEVTCHENKO à Léopol (Lemberg, Austria) has issued the first volume of its *Matériaux pour l'ethnologie ukraino-ruthène* under the editorship of Th. Volkov.

MR A. C. HARRISON, JR., Mr W. H. Furness, and Dr H. M. Miller are making preparations for an expedition to northern Burmah for the purpose of collecting ethnological and archeological specimens for the University of Pennsylvania.

A SPECIAL SESSION of the International Congress of Orientalists, which meets at Rome, October 12th next, will be devoted to researches concerning the origin of the American Indians. Papers on this subject from students of American anthropology will be welcome.

THE PEABODY MUSEUM at Cambridge, it is reported, has received from the heirs of the late Moses D. Kimball a valuable collection of archeological and ethnological specimens.

THE FIRST NUMBER of an archeological magazine has recently appeared at Prague, Bohemia, under the title *Věstník Slovanských Starožitností*. Prof. L. Niederle is the editor.

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PROPERTY MARKS OF ALASKAN ESKIMO

By FRANZ BOAS

Lubbock, I believe, was the first to call attention to the occurrence of a property mark on an arrow collected among the Eskimo of Alaska.¹ An examination of the collections in the United States National Museum at Washington, in the American Museum of Natural History of New York, and in the Peabody Museum at Cambridge, shows that property marks are used very frequently by the Eskimo tribes of Alaska. They occur almost exclusively on weapons used in hunting, which, after being dispatched, remain in the bodies of large game. These are, particularly, whaling harpoons, walrus harpoons, sealskin buoys which are attached to harpoons, lance-heads used for killing whales, and detachable arrowheads. I found also two throwing-sticks provided with property marks. I did not discover any property marks on tools. It appears, therefore, that the object of the property mark is to secure property-right in the animal in which the weapon bearing the mark is found. This agrees with Kittlitz's report,² quoted by Andree in his essay on property

¹ *Prehistoric Times*, 1869, p. 10.

² R. Andree, *Ethnographische Parallelen und Vergleiche*, Neue Folge, p. 84.

marks, who says that the Aleutians hunt whales with harpoons without lines. The whale dies after having received several missiles, and drifts ashore on one of the islands. The people of the village community who find it, first examine the wound in which the harpoon bearing the mark of the community who killed the whale will be found. The latter are at once advised of the stranding, and divide the whale with the finders.

Andree also quotes Holmberg, who says that the Konyags of Alaska place property marks on their sea-otter arrows. As the sea-otter is hardly ever killed by a single arrow, but receives four or five, which are shot by different hunters, the law provides that he whose arrow is nearest the head receives the game. I also found property marks of this kind on a set of sea-otter arrows from Koskimo. Andree states¹ that he saw a property mark on a sealskin buoy from the western coast of Vancouver island.

An examination of the available material shows that the same property marks are found on a great number of specimens; for example figure 17, *c*, occurs on six whaling harpoons. This shows that the marks (at least those on whaling harpoons) cannot be individual, but must be communal. Sets of arrows found in quivers show always the same marks on their foreshafts. It is very interesting to note that harpoons and arrows of a certain form, and showing a certain decoration, always have the same property mark. It would seem that in each village the weapons of a certain group—a boat's crew, family, house community, or any other social unit—use a certain decoration for their implements, which, in connection with certain lines, forms their property mark. In harpoons showing the decoration figure 17, *c*, the Y-shape property mark is never absent. The same is true of the designs shown in figure 16, *c*, *g*, and the connected marks. In the detachable heads of deer arrows I find, in by far the majority of cases, a certain form of the head connected with a certain mark. Figure 24, *a*, *b*, are the forms that are of most frequent

¹ Ibid., p. 84.

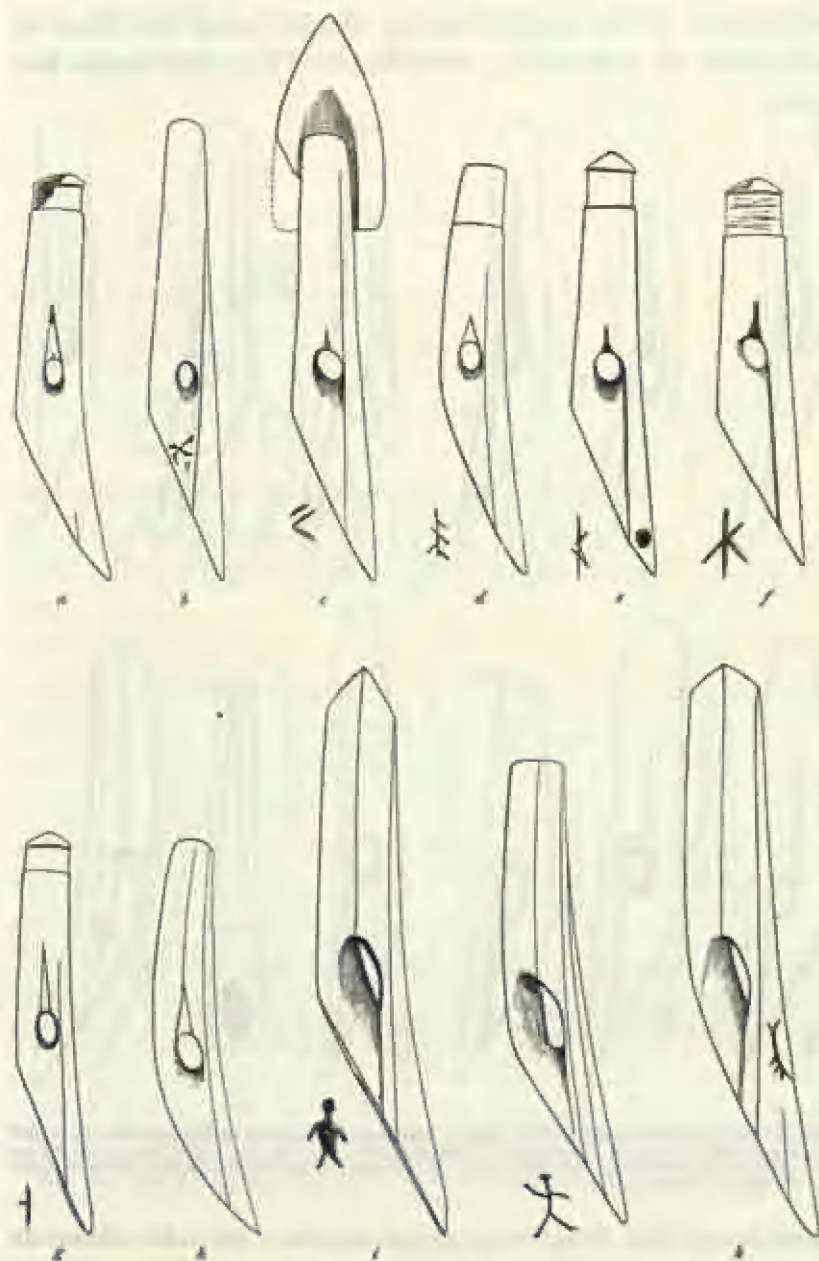


FIG. 16.—Whaling harpoons from Point Hope (in the American Museum of Natural History). One-fourth natural size. *a*, No. 60-1889; *b*, No. 60-1885; *c*, No. 60-1882; *d*, No. 60-1421; *e*, No. 60-1879; *f*, No. 60-1878; *g*, No. 60-1490; *h*, No. 60-1479; *i*, No. 60-1937; *j*, No. 60-1476; *k*, No. 60-1939.

occurrence. Form and decorative design must, therefore, be considered as designating ownership. There are many har-

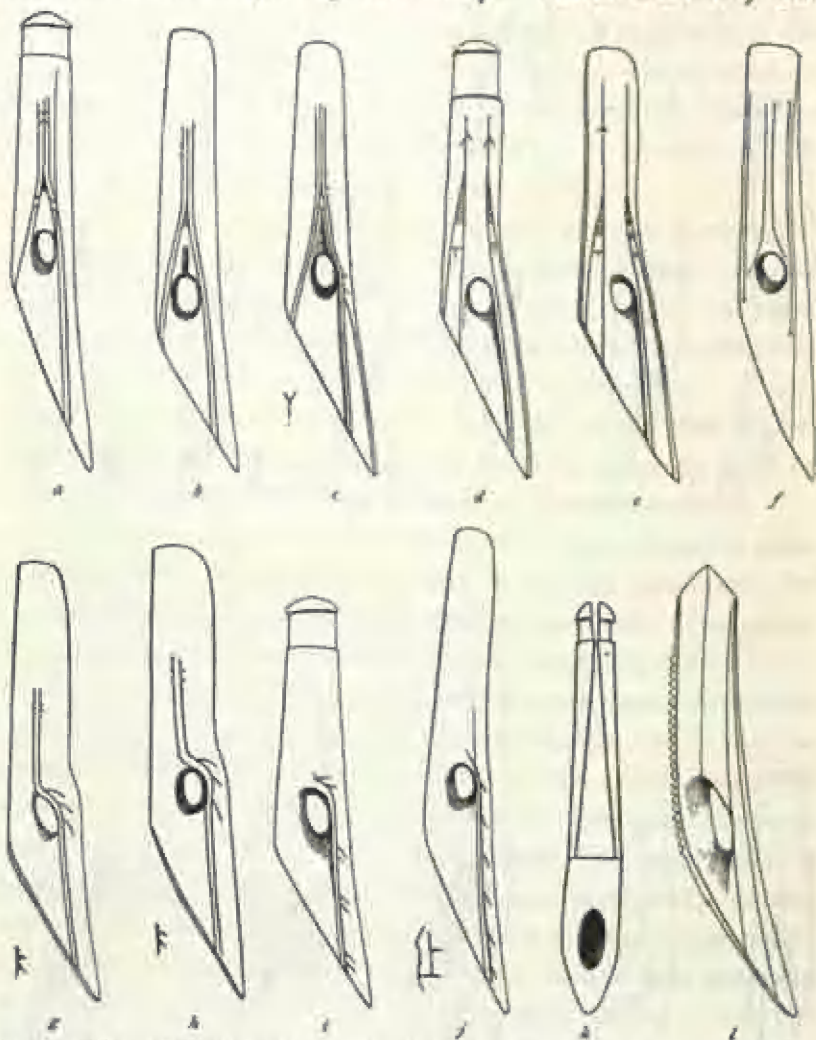


FIG. 17.—Whaling harpoons from Point Hope (in the American Museum of Natural History). One-fourth natural size. *a*, No. 60-1499; *b*, No. 60-1492; *c*, No. 60-1488; *d*, No. 60-1440; *e*, No. 60-1489; *f*, No. 60-1485; *g*, No. 60-1491; *h*, No. 60-1482; *i*, No. 60-1891; *j*, No. 60-1480; *k*, No. 60-1890; *l*, No. 60-1475.

poon-heads that have no property marks. Probably these are sufficiently clearly designated by their form and ornament. Harpoon-heads from different villages differ very considerably in

form, while many from the same village show the same form, although differing in ornamentation. This will be seen by a

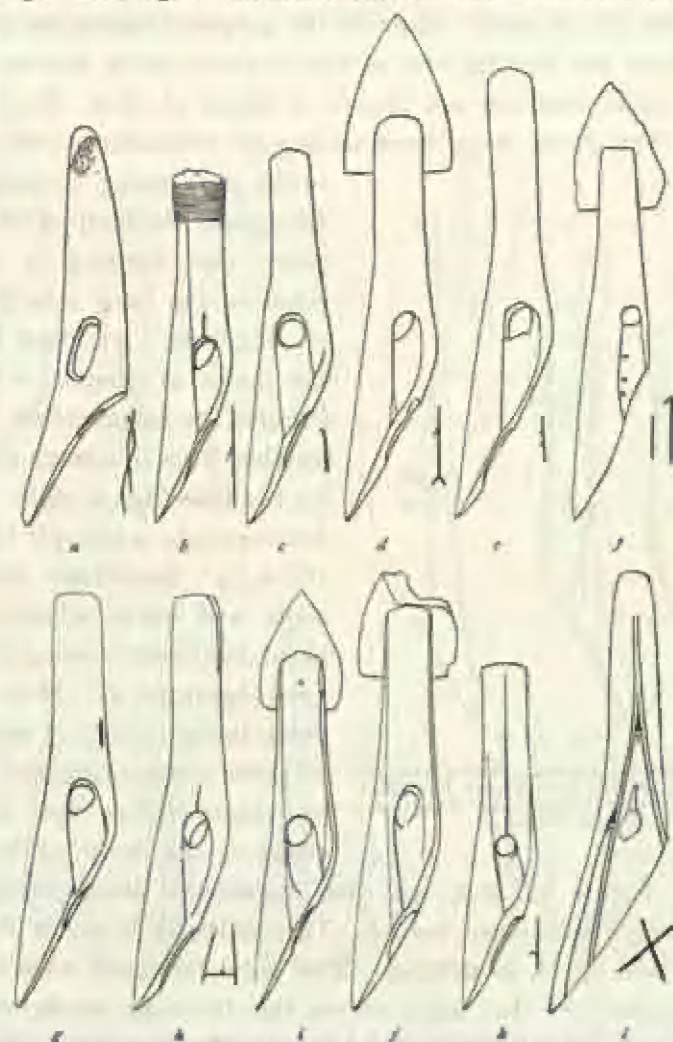


FIG. 18.—Whaling harpoons. One-fourth natural size. *a*, from Diskeneid island, U. S. Nat. Mus., No. 38775; *b-e*, from Point Barrow, U. S. Nat. Mus., Nos. 89748, 89753, 50600, 89755; *f*, from Point Barrow, Peabody Museum, No. 50346; *g*, U. S. Nat. Mus.; *h-i*, from Point Barrow, U. S. Nat. Mus., Nos. 89752, 50601, 89746, ———; *j*, from Point Hope, Peabody Museum, No. 52145b.

comparison of the specimens shown in figures 16 and 17, from Point Hope, with those from Point Barrow. Most of the harpoons from Point Barrow (figures 18, *b-e*, and 19, *a, b*) have

rounded forms and a peculiar curve in the line running from tip to barb, while those from Point Hope show almost a straight line from tip to barb. Most of the property marks are placed just above the slanting base of the harpoon, on its shorter side. Exceptional locations are shown in figure 16, *b*, *k*. Most harpoons from Point Hope have an angular cross-section, the sides

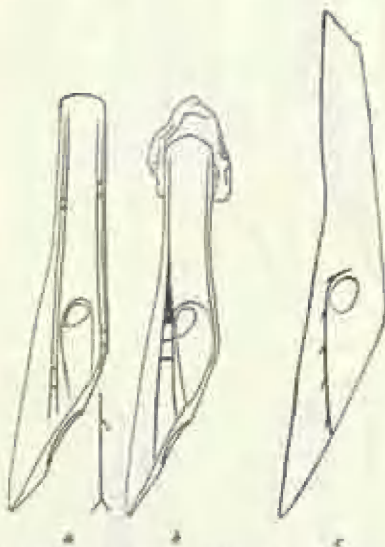


FIG. 16.—Whaling harpoons. One-fourth natural size. *a*, *b*, from Point Barrow, U. S. Nat. Mus., Nos. 59747, 49745; *c*, from Point Hope, Peabody Museum, No. 32145b.

of the barb being strongly set off against the body of the harpoon, and forming a sharp ridge at the long side (figure 16, *b*, *c*, *h-k*). At Point Hope the center of decoration is the hole for the harpoon-line. The simplest form is a notch adjoining the hole (figure 16, *c*). This develops into a triangle (figure 16, *d*, *g*). Sometimes the triangle and notch appear combined, the former having a black apex (figure 16, *a*). More elaborate forms consist of systems of lines surrounding the hole, and these follow the lateral edges on the body of the har-

poon. Figure 17, *a-f*, may be considered developments of the triangle mentioned before. The similarity between figures 17, *a*, and 17, *b*, is striking. The only difference consists in the presence of the notch above the line-hole on figure 17, *b*, and the differing location of the small cross-lines. Figure 17, *d*, *e*, and *g-j* are also very much alike. The first two of the latter series show the same design and the same property mark. This series may perhaps be considered a decoration developed from the forms shown in 16, *e*, *f*. In the harpoons shown in figures 16, *h-k*, and 17, *l*, a middle rib on each side is added to

the three ribs on the long side of the harpoon. At the same time the line-hole is larger and more deeply scooped out on the barb side. Generally the base, on which is the hole for the foreshaft,

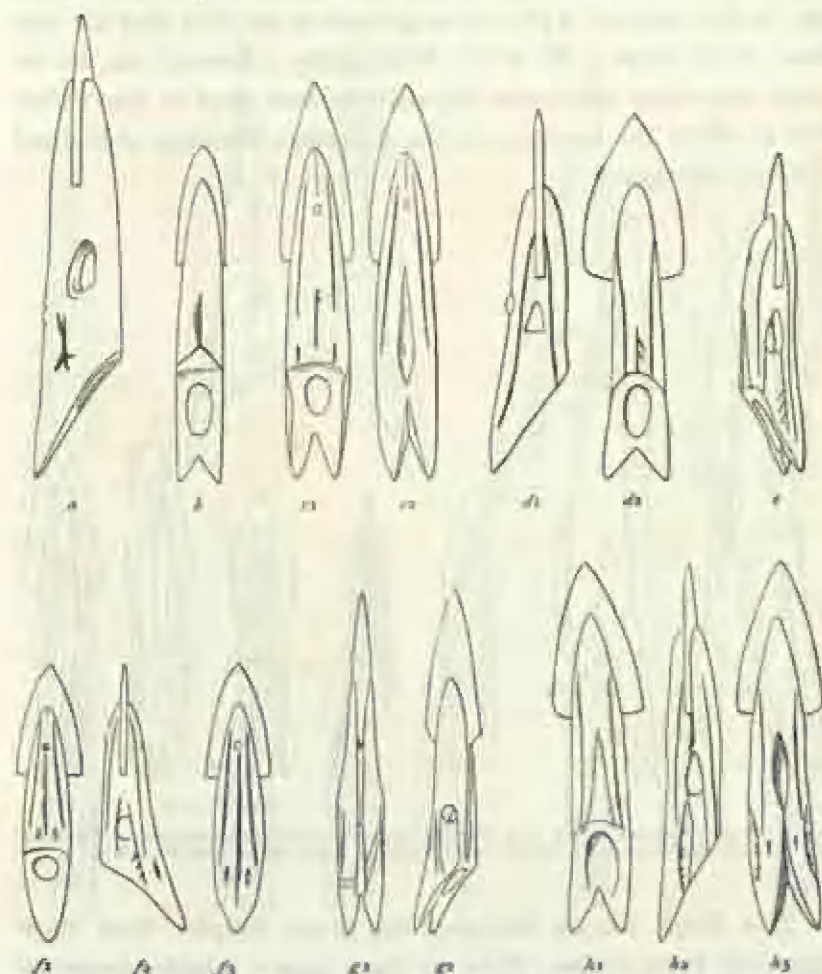


FIG. 16.—Walrus harpoons. One-half natural size. *a*, Port Clarence, U. S. N. M., No. 19099; *A*, St. Michael, U. S. N. M., No. 24732; *c*, Cape Darby, U. S. N. M., No. 44922; *d*, Peabody Museum, No. R 19; *e*, Yukon river, U. S. N. M., No. 153448a; *f*, Sledge island, U. S. N. M., No. 45144; *g*, Kadiak, U. S. N. M., No. 72547; *h*, Yukon river, U. S. N. M., No. 153448b.

is set off at an angle against the short side of the harpoon; but in a few cases there is a curve instead (figure 16, *d*, *h*; figure 17, *l*). Figure 17, *k*, *l*, show no ornamentation on the sides, but only on

the short, flat face. On the type represented in figure 17, *e*, a ridge is found on this face with two notches at its lower end. The harpoon-heads represented in figures 18, *l*, and 19, *c*, belong also to this series of types and suggested to me that they are also from Point Hope. Mr C. C. Willoughby informed me, on inquiry, that these specimens originally formed part of the collection to which the harpoons in the American Museum of Natural History belonged.

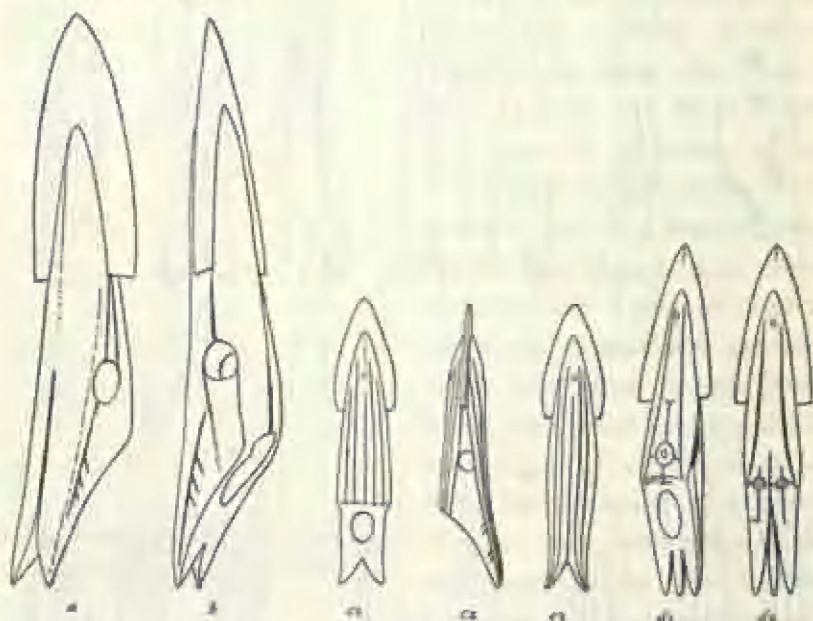


FIG. 21.—Walrus harpoons in the U. S. National Museum. One-half natural size. *a*, No. 73777; *b*, Nulok, No. 38499; *c*, Cape Nome, No. 44634; *d*, Lower Kuskokwim, No. 176173.

The Point Barrow harpoons are much simpler than those found at Point Hope. Most of them have a rounded cross-section and a depression for the line running from the line-hole down to the base. A lateral ridge occurs on figure 18, *k*, only, the locality of which is not certain. The designs on figure 19, *a*, *b*, resemble the Point Hope series (figure 17, *d*, *f*).

Property marks on walrus harpoons are rather rare; but on many of those from Port Clarence (figure 20, *a*) are found two

notches, which probably serve the purpose of property marks, like those on the whaling harpoon shown in figure 17, *e*.

In figure 20, *b*, *c*, *d*, appear property marks in the same posi-

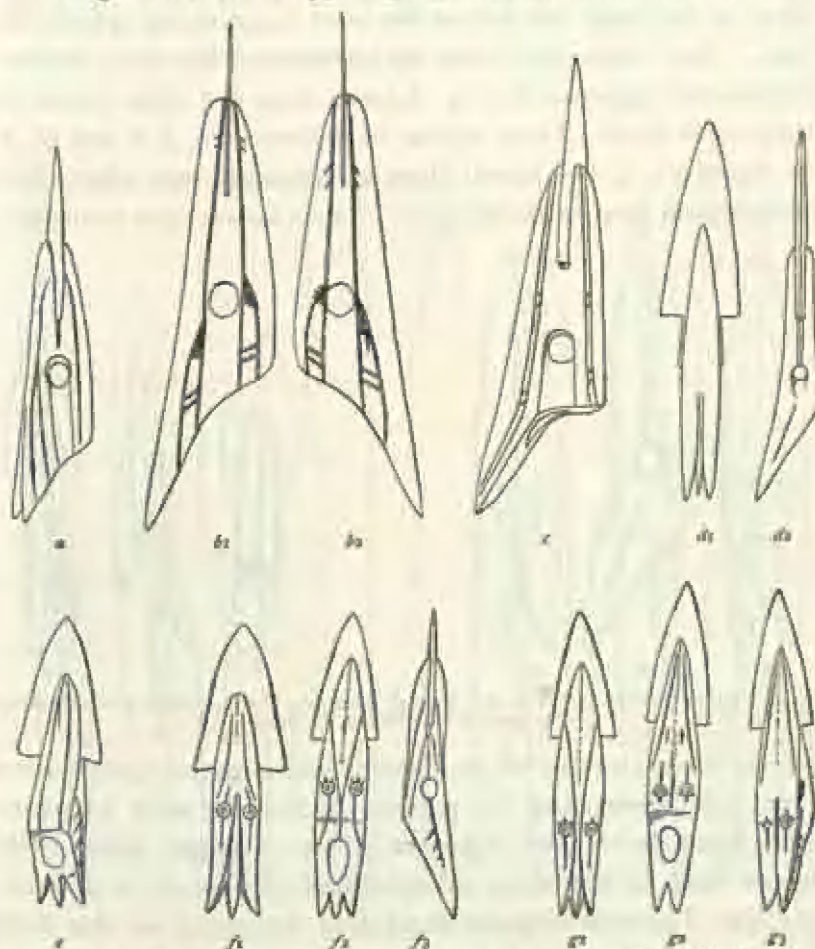


FIG. 22.—Walrus harpoons. One-half natural size. *a*, Point Barrow, U. S. N. M., No. 26621; *b*, Peabody Museum, No. 30347; *c*, Point Barrow, U. S. N. M., No. 26620; *d*, Bristol Bay, U. S. N. M., No. 26628; *e*, Spagunungmut (Nanivak), U. S. N. M., No. 27380; *f*, Kushukuk, U. S. N. M., No. 26411; *g*, Spagunungmut, U. S. N. M., No. 27355.

tions in which they are found on whaling harpoons. The decorations of these harpoons show so much variety that it is almost impossible to find two from different localities that are alike. There is also considerable variation in each locality. The plain

form (figure 20, *a*), without mark and without notches, is quite frequent at Port Clarence. The fundamental elements of decoration consist in a line on the long face, running up from the notch between the barbs, and one on the short face running up from the base. Very often these lines are transformed into long, shallow depressions (figure 20 *b*, *c*, *h*). Lateral lines are often added to this simple form. These appear in figures 20, *c*, *f*, *h*, and 22, *g*. In figure 21, *c*, the lateral lines are changed into ribs which occupy both faces of the harpoon. These lateral lines contribute

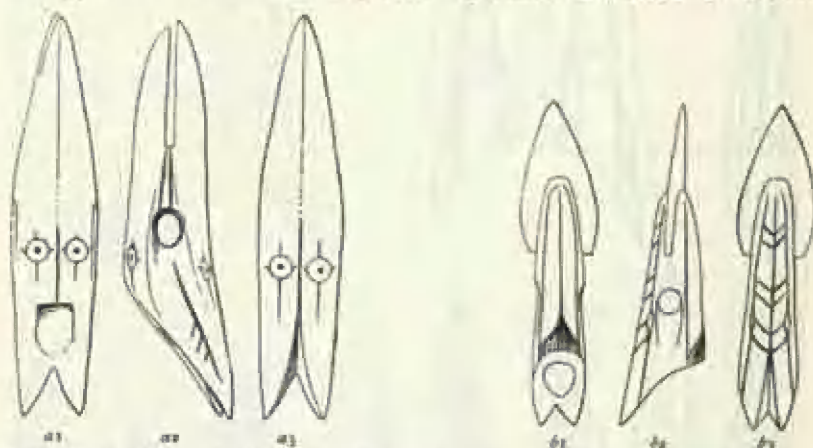


FIG. 23.—Walrus harpoons in U. S. N. M. One-half natural size. *a*, Agalyukchugmut (Nunivak), No. 37944; *b*, Point Barrow, No. 5641.

largely toward setting off the sides of the harpoon as decorative fields. By developing the grooves running in some harpoons from line-hole to base (figure 22, *c*) into a larger surface, this lateral field is still more individualized (figures 21, *d*, and 22, *e*, *f*, *g*). The most frequent element of decoration on this field is a line with several shorter lines branching from it. Three short branch-lines occur in figures 20, *e*, *f*; 21, *a*; 22, *f*, *g*, and 23, *a*; pairs of branches in figures 20, *h*, and 21, *c*. Variations of these designs originate by different combinations of the elements mentioned before and additions of new ones. On the two faces appear dots (figure 20, *f*, *h*), and a circular design which is interpreted by Lucien M. Turner as a flower (figures 21, *d*; 22, *f*, *g*;

23, *a*). In some of these forms the combination looks almost like the face of an animal with snout upward (figures 22, *f* 1; 22, *g* 2). Since these are, however, highly specialized forms, it

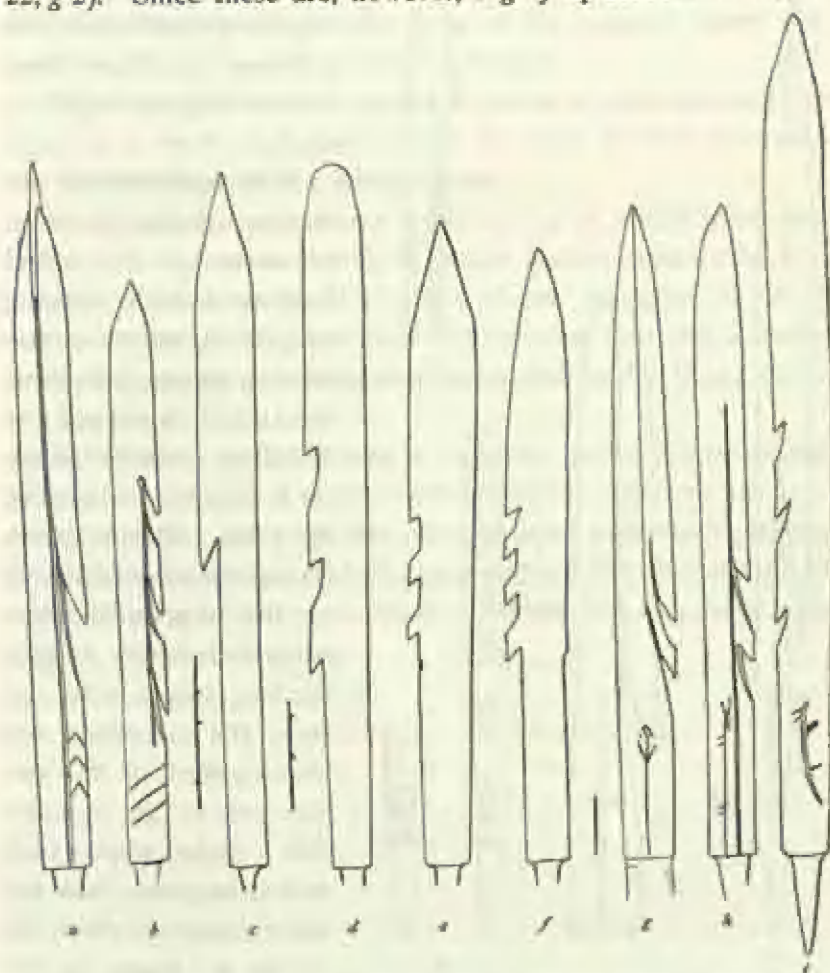


FIG. 23.—Heads of deer arrows. One-half natural size. *a*, Nunivak, U. S. N. M., No. 16415; *b*, St. Michael, U. S. N. M., No. 24500; *c-f*, Peabody Museum, Nos. 1730, 1730, 174, 1733; *g-i*, Nunivak, U. S. N. M., Nos. 16414, 16415, 16413.

seems probable that this is an accident, particularly when compared with the grouping of the same elements in figures 22, *f* 2, and 22, *g* 3. The design on the faces of the harpoon shows a peculiar development in figure 23, *b*.

Three-barbed harpoons show certain peculiarities which are due to the presence of two notches at the base of the long face.

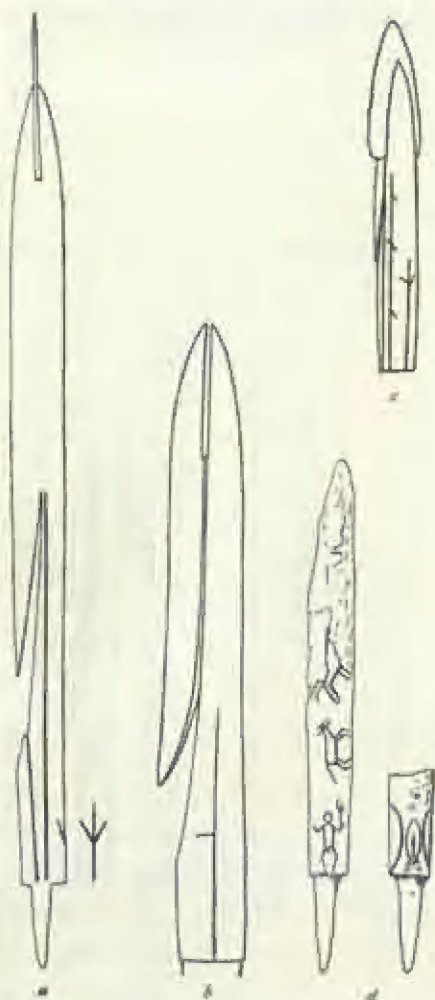


FIG. 25.—Arrowheads and lance-points. *a*, Head of deer arrow, Peabody Museum, No. 26476 ($\frac{1}{2}$ nat.); *b*, Head of deer arrow from Nunivak, U. S. N. M., No. 16414 ($\frac{1}{2}$ nat.); *c*, Point of lance for white whales, from Fort Alexander, U. S. N. M., No. 127631 ($\frac{1}{2}$ nat.); *d*, Head of deer arrow, from St. Michael, U. S. N. M., No. 48300 ($\frac{1}{2}$ nat.).

Here the decoration always begins with two lines running up from these notches (figures 21, *d*; 22, *d*, *f*).

The fundamental difference between the ornamentation of the walrus harpoon and the whaling harpoon is, therefore, that in the former the ornamentation developed on the faces, while in the latter it always developed on the sides. This is due to the fact that the two barbs of the walrus harpoon made it necessary to give the long face a wider surface; the decoration was then applied to this surface and to the opposite side. Only single-barb walrus harpoons show lateral decorations which are similar to those of the whaling harpoons (figure 22, *b*, *c*). The remarkable individuality of form of the most southern harpoon is illustrated in figures 20, *g*, and 22, *d*. The decoration on the back of figure 20, *g*, was observed on two specimens. Possi-

bly it may also be a property mark. It does not seem likely that the decorations of these harpoons developed through conventionalization of realistic forms. Their characteristic features and their dependence upon the form of the harpoon rather suggest that they are purely geometric designs.

Figures 24 and 25, *a, b*, represent marks on deer arrows. In figure 25, *c*, we have a mark similar to those on deer arrows on the detachable point of a whaling lance.

On the whole the property marks consist of simple lines; but in figure 16, *i, j*, we see forms of human beings, in figure 24, *h, i*, long-tailed quadrupeds. The arrow shown in figure 25, *d*, is almost covered with engravings representing men and animals. Possibly figure 24, *g*, represents a flower, and figures 16, *k*; 17, *j*; and 20, *a*, animals.

It is very remarkable that a thorough search did not reveal property marks from any other Eskimo tribe. This fact, taken in connection with the form and occurrence of such marks among the northeastern tribes of Asia, suggests that this custom, like so many other peculiarities of Alaskan Eskimo life, may be due to contact with Asiatic tribes.

PRELIMINARY REVISION OF THE EVIDENCE RELATING TO AURIFEROUS GRAVEL MAN IN CALIFORNIA

By WILLIAM H. HOLMES

SECOND PAPER

INTRODUCTION

The main features of the problem of Auriferous Gravel man in California stand out in bold relief. On the one hand the evidence is interpreted as establishing the existence of a Tertiary man of high type physically and mentally, equal or superior to the Indian tribes of the region today, and occupying a culture plane corresponding to the polished stone age of Europe. It is assumed that this remotely ancient man continued to live and thrive, without perceptible advance or retrogression, while nature passed through a thousand centuries of revolution; or that, as an alternative proposition, if the Tertiary race did not persist but disappeared along with the other mammalian fauna of the time, a new race sprang up, duplicating the physical characters and culture of a former geologic period. There are those high in the councils of anthropologic and geologic science who profess to see no reason for rejecting these bold and extraordinary propositions. On the other hand, there are those who hold that the facts adduced do not warrant either of these conclusions, who see in the whole body of observations and assumptions only a mass of errors and misinterpretations. Thus for a number of years the opposing views have stood without apparent change, the proofs, though strong, not being sufficiently decisive to carry full conviction with regard to a proposition of such exceptional magni-

tude. It is probable that without positive reinforcement the evidence would gradually lose its hold and disappear; but science cannot afford to await this tedious process of selection, and some attempt to hasten a decision is demanded. If new evidence cannot be found, renewed discussion will at least develop the full strength or weakness of the old, and it is especially desirable to take this matter up while some of the pioneers of the Sierra are still with us.

It has been shown in a preceding paper that much of the testimony furnished by Whitney is not well considered, and that there is excellent reason for questioning or rejecting most of the observations placed on record regarding the deep finds. The mines of the more northern counties, already referred to in some detail, seem to have furnished nothing that can be relied upon to prove anything more than the presence of the Digger tribes or their immediate predecessors in the region, and it remains now to look critically into the evidence furnished by the vast diggings of the south, and especially in the great valleys of the Tuolumne and the Stanislaus.

TABLE MOUNTAIN REGION

The region of Table mountain in Tuolumne and Calaveras counties has yielded a large part of the testimony most relied on to establish the theory of an Auriferous Gravel man. Here finds have been reported in bewildering numbers, the objects coming from many sources, often apparently wholly independent of one another. During my visit to this region I sought to get back as near as possible to original sources of information, to see the people having personal knowledge of the finds, and to acquire a correct notion of the aboriginal occupancy before, during, and since the great period of mining activity.

Indian Implements in Mines.—Accompanied by Prof. W J McGee, I journeyed from Jamestown, the railway terminus, situated under the eastern escarpment of Table mountain, to

Sonora, Sawmill Flat, Yankee Hill, Columbia, Springfield, and Shaw's Flat. I crossed over and passed around Table mountain, visiting Rawhide and Tuttletown; and traversing the great gorge of the Stanislaus, spent several days in the vicinity of Murphy's, Altaville, and Angels Camp. These places were all centers of great activity in the early days of gold mining, as amply attested by vast excavations covering many square miles of territory; and I was told by those who had seen it that the Indians flocked in from the surrounding mountains to such an extent that it was not unusual to see the lodges of a thousand Diggers gathered about a single camp; and the hills and valleys still bear ample evidence of their presence. Numberless pits and trenches were then gaping to receive the scattered utensils of these people, whose village sites one after another were undermined and destroyed, and collectors reaped a goodly harvest of supposed ancient relics from the mines. The Snell collection, referred to by Whitney and culled from by Voy, was gathered from this locality and consisted of the usual stone implements and utensils of the Indian tribes, as well as of several forms not in common use today and thought by some to especially represent the ancient time. A remnant of this collection is now owned by Mr J. W. Pownall of Columbia, and will probably pass eventually into the keeping of the University of California. Three specimens were obtained for the National Museum.

As indicated in the preceding paragraph, a thorough knowledge of the aboriginal occupancy is of vital importance in this discussion; but Whitney knew little of the native culture, as his remarks amply show, and he could not have separated objects that had fallen in or had been introduced by other means into the mines from like objects originally belonging in the gravel—if such there were. Neither Whitney nor Voy, so far as I can learn, had any idea of the need and vital importance of such discrimination. Their lists of finds from the mines are hardly more than lists of Indian implements.

Implements from Deep Tunnels.—But what is to be said of the finds reported from the deep shafts and tunnels that penetrate obliquely or horizontally beneath the lava-capped summits of Table mountain? (See figure 26.) Relics of the swarming Diggers could not fall in horizontally, and if these relics do not belong with the fossil animals and plants in the gravels of the ancient river channels, we are left to determine how they could have been introduced, or how deception was so successfully and generally practiced.

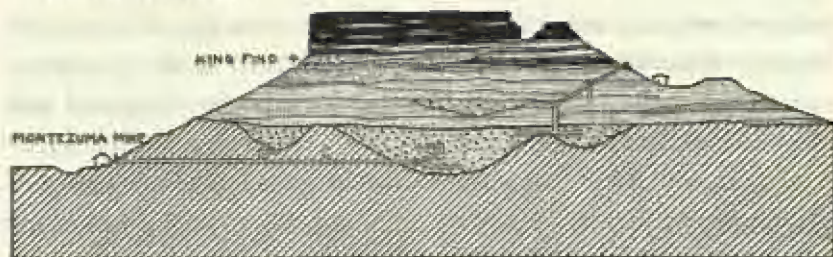


FIG. 26.—Section of Table mountain showing mines penetrating to old river channels. The tunnels are not literally rendered, but are sketched in merely to show the methods of reaching the gold gravels.

The fact that the implements recovered from the deep horizontal diggings are, so far as I have encountered them, all identical in type with the prevailing recent forms, emphasizes the need of inquiring with the utmost care as to whether or not these implements could have been introduced while the mines were in operation. As already shown, the mountain Indians were in those days very numerous about the mining camps. The men were employed to a considerable extent in the mines, and it is entirely reasonable to suppose that their implements and utensils would at times be carried into the mines, perhaps to prepare or contain food, or perhaps merely as a natural proceeding with half-nomadic peoples habitually carrying their property about with them from want of a house in which to lock it up. That any kind of native implement should be carried into the tunnels, there to be lost or forgotten and covered up as the handling and rehandling of gravels went on, is not unnatural.

That such should be afterward dug up with the reopening of passageways and the shifting of the tailings is to be expected, for the search for gold under these old lava beds was not a straight-away boring of the mountains, but a driving and redriving of tunnels in any direction that promised renewed finds of pay material. As a matter of course little attention was paid to the comings and goings of the humble helpers, and if miners came upon stray implements buried in the gravels it is quite natural that they should report them to the foremen or superintendents without seriously considering the question as to recent or ancient origin. Naturally little value was attached to such specimens, as the real significance of their occurrence in the old gravel was at most but dimly understood.

Again, let us not forget, it would be quite within the bounds of probability that some fun-loving miner should seek amusement by reporting objects found about the camp, to the superintendent or others, pretending that they came from beneath the mountain. There can be no doubt that practical joking of this character was prevalent in those days, and that implements of the classes involved in this discussion were known by the miners to excite unusual interest in religious as well as scientific quarters. There are thus two ways in which errors might have crept into the evidence—two ways either of which would lead to that repetition of like finds which is considered so significant by advocates of antiquity.

The Neale Finds.—The case cited in detail by Dr Becker may well illustrate what I have been saying, and this case, it should be noted, is a typical one and constitutes one of the strongest bits of testimony of its class on record.¹ Mr J. H. Neale was superintendent of the Montezuma mine, situated on the western slope of Table mountain, four or five miles southwest of the village of Jamestown. The gold-bearing gravels of the old river bed be-

¹Geo. F. Becker, *Antiquities from under Tuolumne Table mountain in California*; Bull. Geol. Soc. of America, vol. II, p. 159.

neath the mountain, covered by the claim, became exhausted and the mine was closed several years ago. Mr Neale now resides in the town of Sonora, five miles north of Jamestown. In 1877, according to Dr Becker's account, Mr Neale discovered some mortars, pestles, and obsidian implements in the deepest part of the mine, beneath Table mountain and close to the bed-rock. These objects soon passed out of his hands, and one of the mortars with the accompanying pestle (see plate XXVIII) was given to Dr R. I. Bromley of Sonora. Ten years after the finding, these specimens came to the notice of Dr Becker, who, desiring to learn more of their origin, sought out Mr Neale, and obtained the statement to which affidavit was made, the circumstances being given in detail in Dr Becker's paper. The essential paragraphs of the document are as follows:

"At a distance of between 1,400 and 1,500 feet from the mouth of the tunnel, or of between 200 and 300 feet beyond the edge of the solid lava, Mr Neale saw several spear-heads, of some dark rock and nearly one foot in length. On exploring further, he himself found a small mortar three or four inches in diameter and of irregular shape. This was discovered within a foot or two of the spear-heads. He then found a large, well-formed pestle, now the property of Dr R. I. Bromley, and near by a large and very regular mortar, also at present the property of Dr Bromley.

"All of these relics were found the same afternoon, and were within a few feet of one another and close to the bed-rock, perhaps within one foot of it." (P. 192.)

I took the trouble to visit the mine, which was found closed and caved in about the mouth, and with a newly opened mine along side. The site is on a steep slope, falling away to the west from the base of the towering escarpment of the mountain (and apparently much more than 1500 feet from it), and is surrounded by limited areas upon which houses could be built or lodges pitched. All about I found traces of native occupancy, and a dozen mortars, pestles, and pounding stones were picked up; these did not differ in character or material from the corresponding varieties of uten-

sils reported from the deep gravels. The Neale affidavit states that the mortars and other implements therein referred to were found in the tunnel, some 1500 feet from the mouth of the mine, and 200 or 300 feet in beyond the margin of the lava-cap of the mountain, and hence beneath several hundred feet of the volcanic deposits that covered the country before the valleys of today began to be scored out (see figure 26).

Is it not more reasonable to suppose that some of the typical implements of the Indians living at the mouth of Montezuma mine should have been carried in for one purpose or another, imbedded in the gravels, and afterward dug up and carried out to the superintendent, than that the implements of a Tertiary race should have been left in the bed of a Tertiary torrent to be brought out as good as new, after the lapse of vast periods of time, into the camp of a modern community using identical forms?

I took pains to have Mr Neale tell me the story of the finds in all possible detail. The account as related in the work of Dr Becker had evidently passed out of his mind in large degree, as it had also passed out of my own. His statements, made from memory, and written down in my notebook during and immediately following the interview, were to the following effect:

One of the miners coming out to lunch at noon brought with him to the superintendent's office a stone mortar and a broken pestle which he said had been dug up in the deepest part of the tunnel, some 1500 feet from the mouth of the mine (see plate XXVIII). Mr Neale advised him on returning to work to look out for other utensils in the same place, and agreeably to his expectations two others were secured, a small ovoid mortar, five or six inches in diameter, and a flattish mortar or dish seven or eight inches in diameter; these have since been lost to sight. On another occasion a lot of obsidian blades, or spearheads, eleven in number and averaging ten inches in length, were brought to him by workmen from the mine. They had been found in what Mr



MORTAR AND PESTLE SAID TO HAVE BEEN FOUND IN MONTEZUMA MINE BENEATH THE LAVA
CAP OF TABLE MOUNTAIN.

Neale called a "side channel," that is, the bed of a branch of the main Tertiary stream, about a thousand feet in from the mouth of the tunnel, and 200 or 300 feet vertically from the surface of the mountain slope. These measurements were given as estimates only, but at the same time they were, he felt sure, not far wrong. Four or five of the specimens he gave to Mr C. D. Voy, the collector; the others also had been given away, but all trace of them had been lost. Mr Neale spoke enthusiastically of the size and perfection of these implements, and as he spoke drew outlines of long notched blades in the dust at our feet. Some had one notch (see figure 27), some had two notches, and others were plain leaf-shape blades.



FIG. 27.—Outline of obsidian implement said to have been found in Montezuma mine, as sketched by Mr Neale.

Desiring to find out more concerning these objects, he went on to say, he showed them to the Indians who chanced to be present, but strangely enough, they expressed great fear of them, refusing to touch them or even to speak about them; but finally, when asked whether they had any idea whence they came, said they had seen such implements far away in the mountains, but declined to speak of the place further, or to undertake to procure others. This statement by Mr Neale struck me at once as interesting and significant, and I was not surprised when a few days later it was learned that obsidian blades of identical pattern were now and then found with Digger Indian remains in the burial pits of the region. The inference to be drawn from these facts is that the implements brought to Mr Neale had been obtained from some one of the burial places in the vicinity by the miners, who found no spot too sacred to be invaded in the eager search for gold. An additional inference is that the Indians were aware of the

origin of the specimens and were afraid of them because of the mortal dread that every Indian feels of anything connected with the dead. How the eleven large spearheads got into the mine, or whether they ever came from the mine at all, are queries that I shall not assume to answer, but that they did not come from the bed of a Tertiary torrent seems sufficiently clear; for how could a cache of eleven slender, leaflike implements remain unscattered under these conditions; how could fragile glass blades stand the crushing and grinding of a torrent bed; or how could so large a number of brittle blades remain unbroken under the pick of the miner working in a dark tunnel?—for, as Dr Becker states, “the auriferous gravel is hard picking, in large part it requires blasting.”

That the affidavit of Mr Neale does not materially strengthen the evidence favoring antiquity I am now fully convinced. In his conversation with me he did not claim to have been in the mine when the finds were made, and a sworn statement vouching for the truth of assertions made by other persons, and these other persons unnamed miners, cannot be of value in establishing a proposition requiring proofs of the very highest order. That the other like finds of the Table Mountain region, recorded by Whitney and others, are equally open to criticism may reasonably be assumed.

The King Find.—The only bit of testimony that may not be challenged with impunity is the finding of a fragmentary pestle in the face of Table mountain two or three miles north of the Montezuma mine by Mr Clarence King, and reported in detail and with an illustration in Dr Becker's paper (page 193), already referred to. I sought the particular site from which the object was obtained, and passed up and down over every outcrop of rock on the slope, from the lava-cap to the pasture fields below, in the hope of finding some trace of human handiwork, but beyond the usual Digger mealing stones scattered over the surface, nothing was found. I tried to learn whether it was possible

that one of these objects could have become imbedded in the tufa deposits in recent or comparatively recent times, for such an effect is sometimes produced by a re-setting or re-cementing of loosened materials, but no definite result was reached.

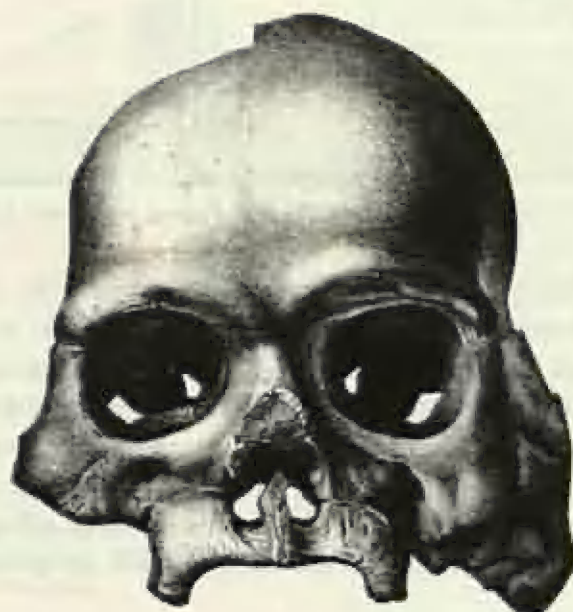
The unfortunate part about this very noteworthy feature of the testimony is that Mr King failed to publish it—that he failed to give to the world what could well claim to be the most important observation ever made by a geologist bearing upon the history of the human race, leaving it to come out through the agency of Dr Becker, twenty-five years later. That he did not promptly give it to his associates engaged in researches regarding human antiquity might be construed as indicating lack of confidence in the verity of his own observations.

THE CALAVERAS SKULL

Notwithstanding the fact that the finds of stone implements in intimate relation with the Auriferous Gravels furnish the great body of testimony upon which a Tertiary man is predicated, they have attracted but slight attention from the public as compared with the reputed discovery of human remains, and more especially the discovery of the so-called Calaveras skull in a mine shaft at Altaville. The prominence of the latter find is due largely to the fact that it is the only specimen of its kind that has escaped oblivion. This relic has been the subject of much disputation, but I shall not stop here to cite or review the literature. It may be observed, however, that the general trend of sentiment and even of scientific opinion has been adverse to the specimen as proof of antiquity; at the same time there is a very important contingent of scientific men, especially those grouped around the original apostle of antiquity, Whitney, who cling tenaciously to the idea of a Tertiary man. As long as this condition exists it is manifestly unwise to attempt to pass over the evidence of the Calaveras skull, as some are inclined to do, with the assertion that it is insufficient and hence unworthy of consideration.

In plate XXIX, *a*, is presented a view of the skull as it appeared when first brought to the attention of Professor Whitney in 1866, and in plate XXIX, *b*, as it appeared after having been cleaned up by Dr Wyman at Cambridge. The former is from a photograph made by Alonzo Rhodes, at Murphy's, California. Being faded, the photograph had to be redrawn for engraving, hence the cut has not the merits of a photograph directly reproduced. The latter is copied from a lithographic plate published by Whitney in his work on the Auriferous Gravels and is manifestly defective, quite a little of the character and natural ruggedness having been lost by the draughtsman. The specimen is now preserved in the Peabody Museum at Cambridge, and comprises about three-fourths of the skull. Enough remains, however, to enable the craniologist to determine something of the physical characteristics and hence of the mental equipment of the person to whom it belonged. The account of the skull given by Whitney includes a careful description by Jeffries Wyman, one of the highest American authorities of the time. The whole subject is presented in such manner as to convey to the unprejudiced mind an impression that the skull is a genuine and well authenticated relic of antiquity.

The skull is said to have been taken from the Mattison & Company mine on the gentle slope of an oblong rounded hill, some three hundred feet in height, situated in the suburbs of Altaville, a mile or more northwest from the important mining town of Angels. This shaft is still open, a roomy rectangular well some one hundred and thirty feet deep, cut in beds of compact, tenacious, volcanic rock and underlying strata of varying character, and has undergone little change in the thirty-three years that have passed since the reported finding of the skull. A road once passed the mine and continued round the hill, but it is now nearly obliterated, and all traces of buildings are gone from the slope which is diversified only by occasional old mine dumps and a growth of scrubby trees. It was my intention to descend into



THE CALAVERAS SKULL

a. Copied from a photograph made by Alvan Rhodes at Murphy's. b. From Whitney's lithographic plate.

the shaft and examine the formations, but there was no time to spare for erecting the necessary windlass. It is important that the formations at the depth from which the skull is said to have come should be examined for comparison with the material adhering to and partially filling the skull, and this work I hope to take up at an early date.

Whitney's Account of the Skull.—According to Whitney's account the skull was taken from the shaft of Mattison & Company's mine in February, 1866. Mr Mattison with his own hands took the skull from near the bottom of a bed of gravel, one hundred and thirty feet from the surface, and within a few feet of the bed-rock—the crystalline slates in which the Tertiary river had carved its channel. It was "lying on the side of the channel [of the Tertiary river] with a mass of driftwood, as if it had been deposited there by an eddy of the stream, and afterward covered over in the deposit of gravel by which bed No. 8 was formed."

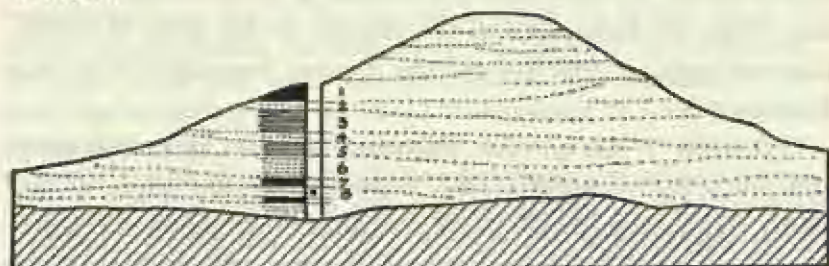


FIG. 28.—Section of the deposits exposed in Mattison mine, Bald mountain. The skull is said to have been found in stratum No. 8.

Figure 28 reproduces a section obtained by Mr Edward Hughes, of Stockton, in connection with an unpublished paper on the Calaveras skull, written by Dr A. S. Hudson. It seems to correspond in every essential feature with the section published by Whitney, and with a section furnished me together with photographs of implements and human and animal remains from the region, by Mr R. E. C. Stearns of Los Angeles.

According to Whitney, Mr Mattison did not recognize the

object as a skull when taken from the gravel, but "thought it to be a piece of the root of a tree." Mr Scribner also stated that when the skull was brought to him "it was so imbedded and incrustated with earthy and stony material that he did not recognize what it was." Mr Mattison, however, seems to have considered the curious gravel-covered lump of sufficient interest to note carefully the conditions under which it was found, "as if deposited in the eddy of a stream," and soon afterward carried it in a bag to Angels, presenting it to Mr Scribner, merchant and Wells Fargo & Co's agent. It was not until a clerk in Mr Scribner's store, probably Mr Matthews, cleaned off a portion of the incrusting material, that any one suspected that the object was a human skull. Soon after this the skull was sent to Dr William Jones, at Murphy's, twelve miles away. The Doctor was an enthusiastic collector of natural history specimens, and, regarding the skull as having more than ordinary interest, wrote to the office of the State Geological Survey in San Francisco, describing the specimen. A few days later, on June 29th, at the request of Mr Wm. M. Gabb, paleontologist of the Survey, the Doctor forwarded it to San Francisco.

Professor Whitney soon afterward visited Calaveras county and proceeded to make careful inquiries into the origin of the skull. He visited Mr Mattison and others, obtaining the statements embodied in his report, and became convinced that the skull had been found precisely as described by Mr Mattison, and that its subsequent history was correctly given by Mr Scribner and Dr Jones.

When delivered to Professor Whitney the base of the skull was "imbedded in a conglomerate mass of ferruginous earth, water-worn pebbles of much altered volcanic rock, calcareous tufa, and fragments of bones. This mixed material covered the whole base of the skull and filled the left temporal fossa, concealing the whole of the jaw. A thin calcareous incrustation appears to have covered the whole skull when found; portions of it had

been scaled off, probably in cleaning away the other material attached to the base" (plate XXIX, *a*). Together the two eminent professors carefully chiseled away the foreign matter adhering to its base, so as to expose the natural surface of the skull, leaving it in its present state (plate XXIX, *b*). The skull was found to be that of a very old person, the teeth being gone, and the alveoli nearly absorbed. The lower jaw is gone, and the cranium is far from perfect; portions of the occiput are missing, and the remaining portions are badly fractured. Professor Whitney expresses his views as to how the specimen came to be thus rudely fractured, and as to subsequent events in its history, in the following words:

"The skull was unquestionably dug up somewhere, and had unquestionably been subjected to quite a series of peculiar conditions. In the first place, it had been broken, and broken in such a manner as to indicate great violence, as the fractures go through the thickest and heaviest parts of the skull; again, the evidence of violent and protracted motion, as seen in the manner in which the various bones are wedged into the hollow and internal parts of the skull, as, for instance, the bones of the foot under the malar bone. The appearance of the skull was something such as would be expected to result from its having been swept, with many other bones, from the place where it was originally deposited down the shallow but violent current of a stream, where it would be exposed to violent blows against the boulders lying in its bed. During this passage it was smashed, and fragments of the bones occurring with it were thrust into all the cavities where they could lodge. It then came to rest somewhere, in a position where water charged with lime salts had access to it, and on a bed of auriferous gravel. While it lay there the mass on which it rested was cemented to it by the calcareous matter deposited around the skull, and thus the base of hard mixed tufa and pebbles which was attached to it when it was placed in the writer's hands was formed. At this time, too, the snail crept in under the malar bone, and there died. Subsequently to this the whole was enveloped by a deposit of gravel, which did not afterwards become thoroughly consolidated, and which, therefore, was easily removed by the gentlemen who first cleaned up the specimen in question, they only removing the looser gravel which surrounded it." (P. 272.)

In cutting away the incrusting material, several fragments of bones were found: some that might have belonged to the same individual to whom the skull pertained, while others evidently belonged to a smaller person. Besides these there were bones of some small mammal, a small snail shell of the species *Helix mormonum*, a small wampum or shell bead, and some bits of charcoal.

Chemical examinations by Mr Sharpless developed the fact that nearly all the organic matter of the bone had disappeared and a large portion of the phosphate of lime had been replaced by the carbonate, indicating a fossilized condition; a trace only of organic matter remained. From Dr Wyman's report, published in Whitney's paper, we learn: 1st, "That the skull presents no signs of having belonged to an inferior race. In its breadth it agrees with the other crania from California, except those of the Diggers, but surpasses them in the other particulars in which comparisons have been made. This is especially obvious in the greater prominence of the forehead and the capacity of its chamber. 2nd, In so far as it differs in dimensions from the other crania from California, it approaches the Esquimaux." (P. 273.)

Portions of the above statements will be referred to in some detail farther on.

Information from Local Sources.—During my short visit to the district I found only a few men who could claim personal knowledge of the skull and of the people most directly concerned in its discovery and immediately subsequent history. Scribner and Jones are dead, and others have removed from the district. At Big Trees, eighteen miles above Murphy's, I found Mr J. L. Sperry, who kept the hotel at Murphy's and was Whitney's host while the latter was visiting that section. He proved to be a good friend of the Professor, and a believer in the correctness of his views regarding the skull. His hotel faced the office of Dr Jones, to whom the skull was sent from Scribner's, and he told me that one day as he was standing in the door of his hotel Dr

Jones came out of his office opposite, and with characteristic imprecations threw a broken skull into the middle of the street. Called upon to explain, the Doctor said that the skull had been brought to him as a relic of great antiquity, but that he had just discovered cobwebs in it, and concluded that he had been made the subject of one of Scribner's practical jokes. Afterward the Doctor picked up the specimen again and carried it into his office, saying that perhaps he had been too hasty, and that he would give it further consideration. Shortly afterward the skull was sent to San Francisco, and a little later Whitney returned to Murphy's and proceeded to make inquiries as to its origin. Mr Sperry drove him to Angels Camp to see Mattison and to obtain from him a statement regarding the discovery of the skull. The statement was obtained, and satisfied Whitney as to the genuineness of the find. The opposition to the evidence was, he said, mainly from religious prejudices and, he thought, had no solid foundation.

Others at Murphy's were familiar with the story, often told and retold, but all were unbelievers and took great pleasure in telling of the practical jokes perpetrated by Scribner and his coterie upon their friends, and upon Dr Jones in particular. In general the versions of the story of the skull were much alike, showing a common origin but having individual variations characteristic of memory recitals. I talked with J. L. N. Shephard, C. A. Curtis, W. J. Mercer, E. H. Schaeffle, and others well informed on the events of the early days; and the statement by Mr Joseph Shephard, a prominent local engineer, made in writing to Mr H. W. Turner of the U. S. Geological Survey, may serve to indicate the general trend of these accounts and the character of the persons connected with the story of the skull. His statement is as follows:

"When the skull was found in Mr Madison's (Mathewson's) shaft, there lived in Angels three men, John Scribner (merchant), William Coddington (ditch owner), and Ross B. Coons (saloon

keeper). In Murphy's there lived William Griffiths (ditch superintendent) and Dr Jones, all good friends one with another, and all owners in the Union Water Company's ditch, except probably Coons. Griffiths delivered the skull to Dr Jones, how long after Madison (Mathewson) found it I know not, but when Dr Jones found cobwebs in it he threw it out of his office, but decided to take it back again. From this on, I suppose the history of the skull is well known. I recollect that when the public began to talk about it, the common belief was that Scribner, Coddington, and Coons, of Angels, and Griffiths of Murphy's, knew how the skull got into Madison's shaft, and used it simply to play a practical joke on their friend Dr Jones; and, as has been said, they were capable of doing it. There is no doubt that Madison was sincere in his belief that the find was genuine."

As all authentic details relating to the history of the skull are valuable, the following extracts are made from a paper written several years ago by Dr A. S. Hudson, of Stockton, now deceased. The manuscript was obtained for me by Prof. Edward Hughes of Stockton, and being imperfectly finished and somewhat erratic in treatment, it is not considered advisable to publish it in full; but such parts as relate to his visit to the mining region are interesting and suggestive and may be given.

In 1883 Dr Hudson corresponded with Dr John Walker of Sonora, who in a letter stated that he had taken a lively interest in the skull, opposing its claims to authenticity, and had endeavored to convince Whitney that he was doing a great injury to science by accepting the evidence. He induced a friend to convey to Whitney the information that "the specimen was found at Salt Spring valley, near the surface, and not in a mine on Bald mountain, but Whitney treated the information discourteously." Continuing, the letter stated that "about the time the discovery was made several caves were found and skulls of the same description taken from them: they were evidently the burial places of Digger Indians. No one about the diggings supposed otherwise."

Later, Dr Hudson visited Dr Walker at Sonora, but made up his mind that the Doctor had little actual knowledge of the matter, and slight foundation for his assertion "that the whole affair was a fabrication and a joke on Whitney." Going on to Angels, he interviewed Scribner and Mattison. He was most favorably impressed with Mr Scribner, who in a dignified and convincing manner assured him that Dr Walker was wrong, and that no deception whatever had been practiced. Having gathered all the facts in the case that Scribner cared to impart, the Doctor visited Mr Mattison, "the veritable miner and supposed discoverer of the head of our inquiry. Fortunately he and his wife were found at home, and without hesitation proceeded to relate the story, with the steps which brought the find to light. The man's wife had a better memory than he, and she seemed to be equally well informed about it. Thus I was furnished with two witnesses in one home. It was said: Late in the year 1865 he, Matson, began to dig for gold. He sank his shaft in Bald mountain and not Table mountain. . . . Reaching the depth of 128 feet the industrious miner struck some old wood. Here in neighborly pose the remains of vegetable and animal [human] life were found. They were found imbedded in gravel and a kind of cement, which he thought was wood also. Taking the round or globular dirt-covered bundle home, he said nothing about it to his family, but kept it in his house a year or more. Here I showed Matson and his wife the figure or cut copied from Professor Whitney's book. . . . Mrs Matson at once recognized the picture as representing the specimen in question. It was said the cemented gravel so adhered to it as to fill out the back head and make it look a natural occipital portion."

Account Given by Mr Scribner.—Dr Hudson left Calaveras county "perplexed and discouraged." The stories told him seemed "incomplete and incoherent." "But," he continues, "some two weeks later Mr Scribner called at our office in Stockton with the welcome errand of a refreshed memory, and with

additional facts fitting into the body of the narrative making it more consistent. . . . It seems, as time went on, Mrs Matson, an orderly housekeeper, began to take a dislike to that untidy thing—an unwashed dead head in her house, and made complaint. It was more in the way than of use or ornament, and she decided to get rid of it. Thereupon her husband, like a proper acquiescing partner in life, carried it to Mr Scribner's store, where at the same time the Wells Fargo Company had its business office. Mr J. C. Scribner and his partner, Mr Henry Matthews, now became the uninvited custodians of the topmost part of an aged and unknown man. . . . This man Matthews had a common failing among people, he was fond of liquor, and sometimes indulged his taste to excess. Some few days or maybe weeks prior to the advent of the skull at Scribner's, Matthews, not feeling well, paid a visit to Dr Jones, a worthy physician at Murphy's, consulted him in regard to his health, and obtained from the Doctor a prescription and medicine. The medicine proved rather strong; it depleted the patient rapidly and produced unlooked-for discomfort. As he grew weaker and impatient under the continued action of the purge, it made Matthews swear, he swore at the unholy medicine and at the d——d outcast of a doctor who gave it. The natural result was he became cross towards Dr Jones. Not to lose sight of the skull, we note that as soon as Mr Scribner saw the dirty rotted remains of old mortality before him, so soon he decided it was out of his line, and he did not want the offensive thing about. But Matthews took to it instinctively and at once. He thought that it with some half-rotted and half-petrified pieces of wood and a few lumps of native ore might do to embellish Dr Jones's cabinet of geological and natural history curiosities. Therefore, they, the uneasy head and the rest, were immediately dumped into an empty potato sack and sent to Dr Jones at Murphy's. On the same day it came without note, comment, or message, and Esculapius opened the sack and took out its contents one by one. After a short inspection of the specimens of

ancient remains, he, with a pious imprecation on the head of the other fellow and his impudence, gave it a toss into the back yard. There the bony thing, which had long resisted the tooth of final destruction, was again exposed to a more quickening action of hurtful elements. There in the damp of rain and mildew it remained for many months unnoticed. There it is quite likely, indeed probable, that the little *Helix mormonum* which can be seen photographed at the right hand base of the figure [plate XXIX, a] became attached.

"At length Mr Matson, in one of his occasional visits to Murphy's, saw, like a familiar ghost, his old acquaintance, the same old head. He inquired of Dr Jones where he got it, not knowing what disposition Mr Scribner and company had made of it. Learning for the first time that several months anterior thereto Matson had dug the head out of his own shaft 128 feet below the surface of the ground, the Doctor then suspected it might turn out something of interest. These unlooked-for facts at once invested the dirty top-knot with new and even profound considerations. It was soon photographed by Mr Alonzo Rhodes of Murphy's, and the negative was sent to Mr Shew at San Francisco where pictures were printed. The attention of Professor Whitney was now called to the resurrected head. He in company with Mr Matson, the miner, visited the now old and abandoned miners' shaft. They found it partly filled with water and dirt, which was soon pumped dry. Mr Matson pointed out on the wall of the bank the precise spot the interesting object lay in conjunction with fragments of wood. The wood he thought was a fragment from quite a large tree. From this spot Whitney told Mr Scribner he gathered gravel and carefully compared it with that scraped from the skull. They proved identical one with the other. It seemed the gravels in the different layers above were of other kinds. This fact precludes the possibility of designing person or persons securing the object 'from Salt-Spring valley' (as opposers have asserted), and dropped it down the

shaft. I inquired of Mr Matson how it came to be rumored that the skull was taken from 'mud spring in Salt Spring valley' and thence conveyed to his mining shaft. He answered that 'Before I began mining at that place and several years back into the decade of 1850, a Mrs Hoffman had gathered several skulls from Salt Spring valley, a place some twelve miles distant from Angels, and had them on exhibition in a sort of cabinet collection.' One of these heads had been fractured and crushed on the left parietal bone, the line of fracture running to the temple. Some similitude or relationship between these and the Calaveras head was believed to exist. But how or in what manner nobody could tell, for none knew.

"It may be proper here to say that Mr Matson is a plain, hard-working day laborer, a blacksmith by calling. He seems to be a very honest-appearing man. He evidences no disposition to magnify, falsify, or to depart from the correct line of truth. Here ends all there is or, as far as I can learn, ever was, about the so-called 'joke' over the Calaveras skull; except its occasional rehearsal, and the more important fact that it was a joke by Matthews on Dr Jones and not on Professor Whitney.

"As mentioned above, the animus of it was not to play upon the spirit of scientific inquiry, nor to deride native anthropological study; but it was a trick sprung on the spur of the moment in a spirit of humorous hilarity by Matthews, Scribner's partner in business. But the Doctor, being the victim, did not see the point."

This story is interesting as emanating from Mr Scribner, who, according to many accounts, knew more than any other person regarding the origin and early movements of the skull.

At Angels Camp I visited Mr Rasmussen, a former business partner of Mr Scribner's, but he had given the matter little attention and did not know whether Scribner believed in the authenticity of the skull or not; but Mr George Stickle, present postmaster of the village, showed a decided interest in the

matter. He had been closely associated with the Scribner coterie in the early days, and knew all the principal people of Angels Camp almost from its foundation. It is his belief that the whole affair grew out of the "joshing" proclivities of his fellow-townsmen, and he laughed heartily as he recited the circumstances of the finding and subsequent misadventures of the so-called Calaveras skull. He went on to state that the skull had been in his store several weeks before it fell into the hands of his fun-loving associates; together with a companion specimen it had been brought to him from a burial place in Salt Spring valley, twelve miles west of Angels, by Mr J. I. Boone. I was extremely sorry not to be able to visit the supposed place of origin of so famous a specimen, for the stories seemed sufficiently circumstantial to warrant scientific attention.

Is it a Changeling Skull?—According to some of the current stories of the region the skull was placed in the mine by one of Mattison's neighbors merely as a joke, while he was at home for dinner, and he is supposed to have found it where it was buried among the debris at the bottom of the shaft. This may or may not be true; at any rate, as no names are given the statement cannot be verified.

The remark made by Mr Stickle and others that the skull obtained by Whitney did not come from the Mattison mine or through Mattison at all, may also have little value as evidence; but it is suggestive, and gives rise to a legitimate inquiry as to the possibilities in the case. There were ancient skulls in plenty in this region in early times, and the valley and county received their name *Calaveras*—which, in Spanish, signifies *skulls*—from this circumstance.

The Indians of the high sierra do not bury their dead, but cast them into pits, caverns, holes in the rocks, and deep gorges. Generation after generation follows one another into these gaping Golgothas where, in a confused heap along with rude personal belongings and sacrificial offerings the bodies decay and are

covered by accumulating debris and deposits from running or percolating waters. As mining operations went on these burial places were cleaned out and the bones became public property. Skulls were plentiful at Angels in those days, as many persons testify. There is, therefore, a chance that the skull sent to Dr Jones was not the one found by Mattison, but a cement-covered specimen derived from some other source as Stickle states and Scribner suggests. Certainly there were several months during which little or no trace was kept of the lump of conglomerate carried home by Mattison. The usual answer to the suggestion that there might have been a changeling skull is that the Calaveras specimen is not a common skull, but a fossil, and must have come from gravel deposits identical with those in Bald mountain if not actually from the Mattison mine, and that its great age is thus sufficiently established. But who shall say that many of the skulls found about Angels Camp were not obtained from comparatively recent burials in surface exposures of auriferous gravels or in other gravels where the conditions were such as to permit of rapid cementation, giving rise to phenomena identical with those observed in the Calaveras skull?

Testimony of the Skull Itself.—Recognizing the fallibility of human testimony and the consequent difficulty of surely connecting the Calaveras skull with the gravels in place in Bald mountain, the characteristics and condition of the skull itself have been appealed to by advocates of its authenticity. The report on its physical characters, however, made by Jeffries Wyman, does not in any way aid the case. It is to be expected that a Tertiary skull would in some manner show or suggest inferior development, but this skull appears to represent a people superior to the present Indian tribes of the region. Again, it is to be expected that some distinctive characteristic, some race peculiarity, would appear in the skull of a people separated by uncounted centuries from the present; that it would be longer or shorter, thicker or thinner, or more or less prognathous than the Indian skull, but

Wyman has nothing more startling to say than that "in so far as it differs in dimensions from the other crania from California, it approaches the Esquimaux." This vague variation is just as likely to be an individual peculiarity as a racial character. It need not be regarded as strange that the skull should be superior to the average Digger cranium, for no anthropologist would be willing to affirm that the Diggers are the first and only people who have occupied this region during the present geological period. The chances are that the Shoshonean stock, to which these Diggers belong, is a somewhat recent intruder on the western slope of the sierra in California; and more than one of the present or past groups of Pacific Coast Indians may have passed this way at some period in their history. The practical identity of the skull with modern crania speaks very eloquently against extreme antiquity.

Professor Whitney lays much stress upon the fact that the specimen is undoubtedly a fossil. "Chemical analysis proves that it was not taken from the surface, but that it was dug up somewhere, from some place where it had been long deposited, and where it had undergone those chemical changes which, so far as known, do not take place in objects buried near the surface." If there was a trick on the part of fun-loving miners, "they must themselves," he adds, "have obtained from somewhere the object thus used; and as all the diggings in the vicinity are in gravels intercalated between volcanic strata, it becomes, really, a matter of but little consequence, from a geological point of view, from whose shaft the skull was taken."¹ It would appear that Whitney failed to notice that although the gravels were originally wholly intercalated with strata of volcanic materials, they have been exposed in many places by the erosion of valleys, that they outcrop on the hillsides and lie uncovered in the valleys, and that any of the modern tribes may have buried their dead in previously undisturbed Tertiary river gravels. I learned of more than one

¹ *Auriferous Gravels*, p. 271.

case of this kind; and when so buried, there is no reason why the osseous remains, especially if deeply covered by over-deposits of shifting materials, should not have assumed, in a comparatively short period of time, exactly the conditions characterizing a fossil. Such comparatively recent burials in exposed very ancient river gravels may readily have taken place within less than a thousand yards of the Mattison mine.

The term *fossil* really signifies little in this connection, although assumed by some to signify much. No one would venture to assert that a skull might not lose nearly all its organic matter, and that a large portion of the phosphate of lime might not be replaced by the carbonate in a few hundred years if the conditions were reasonably favorable to the change. That such changes do not readily take place very near the surface is probably true; but we must not lose sight of the fact that, setting aside the possibility of the accumulation of deep overlacements, burial in caves and pits was practiced in this section and that these receptacles are sometimes of very considerable depth. Bodies cast in are rapidly covered up and are subject to just such conditions as those favoring fossilization.

It should be noted that silicification of the osseous matter of the skull is not mentioned; iron and lime are cementing agencies merely. Iron is everywhere and its reactions are rapid; and in a region abounding in limestone formations calcareous matter is freely dissolved, carried, and deposited by the waters. The conditions characterizing the skull are just such as might be expected in a skull coming from one of the limestone caves, crevices, or pits of the district. The thin film of calcareous matter coating the skull and extending throughout the porous filling makes it heavy, but does not necessarily indicate a prolonged period of inhumation.

It would appear from statements made by Scribner (in Hudson's paper, already quoted) that Whitney descended into the mine and examined the gravel bed from which the skull is said to

have been obtained, but in his monograph the latter states that he failed to accomplish this on account of the water in the mine. He says that "the excavation has remained filled with water during the whole time since the skull came into my possession." (Page 271.) However, some one must have succeeded in overcoming the difficulty, as Dr W. H. Dall states¹ that while in San Francisco in 1866 he compared the material attached to the skull with portions of the gravel from the mine and that they were alike in all essentials. But even if the material from the mine is like that attached to the skull nothing is proved, as the same may well be true of materials from many parts of the Angels district. The peculiar agglomeration of earth, pebbles, and bones is readily explained by referring to conditions existing in the limestone caverns and crevices of the region where the calcareous accretions bind together bones, gravel (very generally present), cave earth, and whatever happens to be properly associated, in just such manner as that illustrated in the specimen under discussion.

Again, much stress is laid on the fact that the skull obtained by Whitney "had been broken in such a manner as to indicate great violence," as if subject to severe blows while swept by a torrent over a bed of boulders. When it is remembered that the fractures exhibited by the skull are fresh and sharp, this highly imaginative statement (previously quoted in full) loses its force, for the tossing in a torrent over boulders would not only have bruised and abraded the sharp edges of the bone, but the loose earth, broken bones, wampum, and shells, instead of being jammed into the skull would have been quickly dislodged and widely scattered by the rushing waters. The facts are, and may be stated emphatically, that the conditions of fracture and the impacting of bones of more than one individual along with other miscellaneous articles in the cavities of the skull, are just such as would occur as a result of pitching body after body into an

¹ *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1890.

Indian burial pit where young and old were jammed into a conglomerate mass and covered with earth, gravel, and stones.

The presence of a wampum bead imbedded with the earth, bones, and pebbles in the skull is a strong argument against antiquity. It is not claimed that this shell bead is fossilized, and it would seem that it resembles in every way—size, shape, manner of boring, and degree of elaboration—the concavo-convex beads made from clam shells and worn by members of nearly every Indian family in California. That a Tertiary people should have made and worn the identical form seems highly improbable.

The small snail shell, the fragile *Helix mormonum*, found also in the skull, is much more at home in a modern burial place than in the torrent-swept bed of a Tertiary river. The species is recent, and I am not aware that it has been found in Tertiary formations.

It thus appears that the so-called Calaveras skull exhibits nothing in its character, condition, or associated phenomena incompatible with the theory of recent origin, and very much that may be justly construed as favoring that theory.

The Skull at Cambridge.—On returning to the East I took the first opportunity of visiting Cambridge for the purpose of examining the Calaveras skull. Professor Putnam very kindly removed the specimen from its resting place and permitted me to examine it at leisure and to handle the loose materials—the lime-cemented earth, the bits of bone, and the shell bead—detached by Professor Wyman. He preferred, however, that I should not attempt to describe the relics, as he had in view the publication of a paper giving his views and an exhaustive chemical and comparative study of the skull. This idea I hope to see him carry out at an early day, as it is manifestly the duty of the custodian of so important a relic to place it freely and fully before the world. If there is anything to add to what Whitney and Wyman have already said, the present generation of anthropologists should have the benefit of it. It is now thirty-three years since the specimen was carried to Cambridge.

I looked forward with much interest to this glimpse of the specimen about which so much has been said and upon which so much has been predicated, and was prepared to be duly impressed with its character as a fossil, but I was distinctly disappointed. The importance of the skull as an index of antiquity has been over-estimated. I find myself confirmed in the conclusions forced upon me by a consideration of the evidence already presented, namely, that the skull was never carried and broken in a Tertiary torrent, that it never came from the old gravels in the Mattison mine, and that it does not in any way represent a Tertiary race of men. If the existence of Tertiary man in California is finally proved, it will be on evidence other than that furnished by the Calaveras skull.

SUMMARY

A brief summary of the arguments for and against the great antiquity of man in California may well be presented here for convenience of reference. The principal considerations arrayed in support of the affirmative are as follows :

(1) During the three or four decades succeeding the discovery of gold in California the miners of the Auriferous belt reported many finds of implements and human remains from the mines. The formations most prominently involved are of Neocene age; that is to say, the middle and later portions of the Tertiary.

(2) Most of the objects came from surface mines, but some were apparently derived from tunnels entering horizontally or obliquely and to great depths and distances beneath mountain summits capped with Tertiary lavas, leading to a belief in their great age.

(3) The finds were very numerous and were reported by many persons, at various times, and from sites distributed over a vast area of country. They were made by inexpert observers—by miners in pursuit of their ordinary calling,—but the statements made by them are reasonably lucid and show no indications of intentional exaggeration or attempted deception.

(4) The stories as recorded are uniform and consistent in character and the objects preserved are, it is claimed, of a few simple types, such as might be expected of a very ancient and primitive people. The evidence, coming from apparently unrelated sources, is described as remarkable for its coherency.

(5) The reported finding of an implement in place in the late Tertiary strata of Table mountain by Mr Clarence King, a leading geologist, gives countenance to the reports of inexperienced observers.

(6) The osseous remains recovered are, in some cases, said to be fossilized, having lost nearly all their animal matter, and some are coated with firmly adhering gravels resembling those of the ancient deposits. These conditions give rise to the impression of great age.

(7) The remains appear to be associated with flora and fauna indicating conditions not antagonistic to the existence of the human species.

(8) The evidence as presented by Whitney and others seems abundant and convincing, and many scientific men have accepted it as satisfactory proof of a Tertiary man in America.

On the other hand numerous considerations are urged against great antiquity, as follows:

(1) It is held that the strength of testimony should be proportioned directly to the magnitude of the propositions to be supported, and that this case requires proofs of a higher order than have as yet been presented.

(2) The existence of a Tertiary man, even of the lowest grade, has not yet been fully established in any country, and this California evidence, therefore, stands absolutely alone. It implies a human race older by at least one-half than *Pithecanthropus erectus* of Dubois, which may be regarded as an incipient form of human creature only. The finds reported indicate a Middle Tertiary people well advanced in the elements of culture; and culture, especially in the earlier stages, is necessarily of exceedingly slow

growth. The *Pithecanthropus* of California would have to be looked for somewhere in the early Tertiary if not in a preceding period. The burdens thus thrown upon the Auriferous Gravel evidence are enormous.

(3) The proposition that a Tertiary man could survive to the present time surpasses belief. The physical and biological changes in the region have been profound and far-reaching. The western half of the continent has been twice or thrice remodeled since Middle Tertiary times, and every known species of plant and all species of the higher forms of animal life have been obliterated. Evidence based on random and inexpert observations is not sufficient to establish such a proposition.

(4) If it could for a moment be admitted that man did survive throughout the ages and continental transformations, it appears quite impossible that his physical characters and his culture should have remained unchanged. It is equally impossible that a modern race could have sprung up duplicating the man of a million years before in every essential particular.

(5) Examination of the human relics reported from the gravels fails to give support to the claim of antiquity. Fossilization of the osseous remains, upon which so much stress has been laid, may have taken place in comparatively recent times. The chemical changes noted are such as might be expected to characterize remains buried for a few hundred years in the deep pits and caverns of the region. The crania recovered are identical in character with recent crania.

(6) Objects of art from the Auriferous Gravels are said to be of the most primitive character, and, in large measure, peculiar to the gravels. When critically examined, however, they are found to belong to the polished stone age and to duplicate modern implements in every essential respect. They are such as may have fallen in from Indian camp sites or been carried in by the Indians themselves. They are made from varieties of stone belonging to formations ranging from the oldest to the youngest found in

the district, and have been shaped by the ordinary processes employed by our aborigines. They evidently served purposes identical with corresponding implements of our Indian tribes.

(7) None of these objects show evidence of unusual age, and none bear traces of the wear and tear that would come from transportation in Tertiary torrents. These striking facts relating to the condition of the human remains confirm and enforce the impressions received from a study of the geological and biological history of the region.

(8) The case against antiquity is strengthened again by a study of the recent history of California. All the phenomena relied upon to prove antiquity can be accounted for without assuming a Tertiary man. Indian tribes have occupied the region for centuries. They buried their dead in pits, caves, and deep ravines where the remains were readily covered by accumulations of debris or of calcareous matter deposited by water. As soon as mining operations began the region became noted as a "place of skulls" (Calaveras).

(9) Coupled with the above is the fact that no other country in the world has been so extensively and profoundly dug over as this same Auriferous Gravel region. The miners worked out the ossuaries and, at the same time, undermined the village sites, and thousands of the native implements and utensils were introduced into the mines and became intermingled with the gravels. Implements and utensils may also have been introduced into the deep mines by their owners who were helpers in the mining work.

(10) When these objects began to be observed by the miners, individuals interested in relics commenced to make collections, but neither miners nor collectors understood the need of discrimination, the fact that the objects came from the mines being satisfactory evidence to them that they belonged originally in the gravels.

(11) Again, it is possible that deception was often practiced.

A mining camp is the natural home of practical joking, and the notion that finds of human relics in the gravels tended to excite heated discussion would spread quickly from camp to camp until the whole region would be affected.

(12) The testimony furnished is greatly weakened by the facts (1) that the finds on which it was based were made almost wholly by inexperienced observers, and (2) that all were recorded at second hand. Affidavits cannot redeem it. Nothing short of expert testimony, amply verified and vigorously stated, will convince the critical mind that a Tertiary race of men using symmetrically shaped and beautiful implements, wearing necklaces of wampum and polished beads of marble or travertine bored accurately with revolving drills, fishing with nets weighted with neatly grooved stone sinkers, and having a religious system so highly developed that at least two forms of ceremonial stones had been specialized, occupied the American continent long enough to develop this marked degree of culture without leaving numerous and distinctive traces of its existence.

THE BEGINNING OF MATHEMATICS¹

By W J MCGEE

I

Chemistry grew out of alchemy as natural experience waxed and primeval mysticism waned in reciprocal measure; and in earlier time astronomy grew out of astrology in similar fashion. The growth of chemistry is fairly written and that of astronomy meagerly recorded in early literature; and in the history of both sciences the records are corroborated and the sequence established by vestigial characteristics, which are no less useful in defining mental development than are vestigial organs and functions in outlining vital evolution.

The beginning of chemistry marked the third step in the development of science; the beginning of astronomy marked the second step; the first step, taken amid the mists of unwritten antiquity, was marked by the beginning of mathematics. In the absence of records, the rise of mathematics may be traced partly (like that of the next younger sciences) by vestigial characteristics; and these characteristics indicate that, just as scientific chemistry came out of mystical alchemy, and as scientific astronomy sprang from mystical astrology, so scientific mathematics grew out of a mystical system which long dominated the minds of men and slowly waned under the light of natural experience concentrated among the Arabs of past millenniums. In Arabia this mystical system preceded the essentially natural (though happily conventional) system of algorism, which opened the way to numerical treatment of quantities, and thus gave a foundation

¹ Read before the American Association for the Advancement of Science (Section H) at Columbus, August 22, 1899.

for science; it even antedated conventional algebra, in which symbols are used to represent natural values, and seems to have dropped into the background of thought with that long-abandoned side of algebra, *almacabala* (or *almachabel*)—a jumble of occult or semi-occult redintegration which appeals strongly to the half-developed mind. So the stepping-stones to science may be enumerated as *almacabala*, astrology, alchemy, leading respectively to mathematics and astronomy and chemistry, the oldest branches of definite knowledge.

While the transition from *almacabala* to mathematics is indicated by vestigial characteristics among the peoples influenced by Arabic culture (the Aryans and their associates, who make up the intellectual world), the sequence is established by parallel phenomena displayed by other lines of culture. The import of these parallel phenomena becomes clear in the light of cardinal principles, pertaining both to science in general and to anthropology in particular: (1) In all science it is necessarily postulated that knowledge grows by successive increments, through experience and its assimilation, through observation and comparison (or generalization), through discovery and invention—i. e., through natural processes; (2) in all branches of definite knowledge, but especially in anthropology, it is implicitly if not explicitly postulated that knowledge is diffused and its acquisition stimulated through association and interchange among individuals and peoples; (3) in anthropology, as in other sciences, it is necessary to recognize a body or volume of knowledge proper to each people, made up of the combined possessions of all the individuals, increasing with successive experiences, decreasing only through neglect or disuse, and in greater part perpetuated by record and tradition if not by direct heritage; (4) in anthropology, as measurably in other sciences, it is desirable to assume that (*a*) mental capacity and (*b*) the sum of knowledge, either in the individual or in the group, are in the long run practically equivalent; and (5) in anthropology it is

convenient to assume that the course of mental development is approximately uniform (or about as nearly similar as are environmental conditions) in each separate or independent group of men—this assumption, which is rapidly crystallizing in the minds of anthropologists, being but a corollary of the primary postulate on which all science rests, namely, that knowledge grows by natural means.

The mere recognition of these principles renders it clear that the particular growth-stage of any intellectual stock (or people) may be defined with approximate accuracy by gauging the mentality of other peoples developed to corresponding stage, just as the history of the aged sequoia grove of prehistoric birth may be read in terms of younger groves on neighboring ranges; for the towering forests of the big-tree species and the upshooting forests of human ideas may well be likened in individual and collective growth, save that the vegetal species is decadent and shrinking into separate groves in scattered holts, while the mental growth is luxuriant and spreading exuberantly from province to province throughout the lands of the earth. The interpretation in terms of growth-stages is established by conformity with natural law; did the forest receive extra-natural impulse at any stage, or did knowledge arise otherwise than through interaction with nature, the interpretation would fail; but in the absence of evidence against the uniformity of nature, the equivalence of corresponding stages must be recognized alike for the figurative forests of ideas and the material forests of wood and leafage.

The acceptance of these cardinal principles affords a means of tracing the unrecorded history of Aryan culture, and of interpreting the meager records of Arabia's mathematical pioneering in terms of the culture of other peoples still below, or just rising upon, the plane marked by the birth of writing. Especially useful for comparison are various practically independent Amerindian peoples, some low in prescriptorial culture, others trembling on the verge of definite graphic art, and still others within

that phase of scriptorial culture marked by conventional calendric and numerical systems; hardly less useful are several African peoples representing various stages of development; equally significant, too, are the Australasian tribes of culture so low that numerical knowledge is inchoate only; while useful suggestions as to the origin of numerical concepts may be obtained from various subhuman animals. True, the lines of growth maturing in mathematical systems must vary with environmental conditions, and doubtless with hereditary traits persistently reflecting both ancestral and proto-environmental factors; yet, if knowledge be not an extra-natural product rather than a reflex of nature (as brilliantly conceived by Bacon) the lines must be so far conformable as to render the comparisons trustworthy and sufficiently accurate for practical purposes—just as the retracing of the history of an isolated grove by comparison with the growth-lines of other groves must be inexact in detail, though trustworthy in general and sufficiently accurate to meet practical needs.

II

In tracing lines of activity maturing in civilization and enlightenment, it is needful to note certain habits of mind characteristic of all primitive men; and for present purposes (as for practically all others), it suffices to define primitive peoples as those who have not yet acquired and assimilated the art of writing—i. e., as those who remain in prescriptorial culture:

1. Primitive men are mystics. Believers in extra-natural potencies, skillless observers, and inconstant reasoners, their faith counterfeits realities, and clothes its own figments with all manner of attributes, both appropriate and incongruous. In their simple (and presumptively primeval) aspect, the fear-born figments are grotesque shadows or fantastic duplicates of actual things, moved by caprice or malice like unto that of human kind; grown more complex, the figments are incarnated chiefly in

self-moving things and invested with intensified autonomy ; and in the higher stages of primitive culture, they are idealized into mystical potencies actuating the phenomena of the universe in accordance with impulses and motives reflecting those of the primitive mind. In all its aspects, the faith is profound ; it is an ever-present possession, passing even into complete obsession, whereby thought and action are habitually and wholly controlled.

In every phase of primitive culture, the mystical potencies are deemed chief factors of failure or success in the ceaseless strife for existence ; they are invoked by fasting, propitiated by sacrifice, celebrated by feasting, and generally expatiated by individual and collective ceremony and by the marvelously persistent tradition of prescriptorial culture ; and since the successful men and tribes give more thought to joyous glorification and less to anxious propitiation than their unsuccessful contemporaries, the beneficent potencies tend to survive and the maleficent mysteries tend to die out of the darksome—yet ever brightening—faith of primitive men.

In every stage of primitive faith the controlling mysteries are associated with symbolic objects and actions, and both mysteries and symbols are zealously enshrouded in deeper mystery. So fetishism and shamanism grow apace, and not only ceremonial objects but places and persons and forms of utterance become secret or sacred ; esoteric observances, impressive insignia, and imposing formalities are established ; and systems of rank or caste grow up as tangible expressions of the intangible subjective structures. Cumulatively strengthened by reaction of symbol on mystery and of mystery again on symbol, the pervading mysticism is intensified above all other motives in the primitive mind ; and the artistic concepts, the industrial devices, the social relations, and the subjects and forms of speech pass under the control of the unreal potencies which shadow all primitive thinkers.

Throughout primitive culture, invocation habitually carries an obverse of incantation, and the normal course of fiducial development is at-

tended by persistent sortilege or thaumaturgy ; and in the higher strata necromancy and soothsaying, spells and enchantments, conjury and exorcism, oracles and ordeals, and divination by lot or chance, become characteristic. In the higher strata, too, expressions supplement or supplant the objective symbols of lower plane, and the jargon of jugglers and the farrago of fakirs take the place of fetishes and idols ; and it is particularly significant that words and verbal formulas come to be regarded as superpotent expressions of mystical power. Some savage tribes regard their language as sacred, some have hieratic languages, and among all known tribes personal names are considered magical or tabu in one way or another ; while just within the lower strata of scriptorial culture (as illustrated by the Arabs and Hindoos and other Eurasians of a few centuries ago, and attested by literary and linguistic and objective vestiges), shibboleths and numerical formulas become rife, and the inscribed talisman and abracadabra and mystical number, and eventually the magic square, form favorite symbols of occult power.

With the growth of writing and the decadence of tradition, mysticism began to lose control of the human mind ; but innumerable vestiges along the line of Aryan culture, as well as the examples afforded by other lines, demonstrate the potency of this primeval factor and the tenacity of its hold on the human mind.

2. Primitive men are egoists. Knowing little of the external world, tribesmen erect themselves or their groups into centers about which all other things revolve according to the caprice of their all-potent mysteries ; they act and think in terms of a dominant personality, always reducible to the Ego, and an Ego drawn so large as to stand for person, place, time, mode of action, and perhaps for *raison d'être*—it is Self, Here, Now, Thus, and Because. Science shows that the solar system hurtles through space, presumably about an unknown center ; it showed before that the sun is the center of our system ; but the heliocentric system was expanded out of an antecedent geocentric

system, itself the offspring of a democentric system, which sprang from an earlier ethnocentric system born of the primeval egocentric cosmos of inchoate thinking.

In higher culture the recognized cosmos lies in the background of thought, at least among the great majority; but in primitive culture the egocentric and ethnocentric views are ever-present and always-dominant factors of both mentation and action. Their prominence is exemplified by kinship organization, the universal basis of primitive society; and this organization cannot better be illustrated than by analogy with the planetary assemblage: Each individual rotates independently, may be attended by satellites, and revolves first about the head of the family and later about the patriarch of the group, yet each exerts a definite attractional influence (albeit proportional to individuality rather than mass) on all his associates; and the relative social positions are expressed and kept in mind by habitual conduct and form of speech. The primitive man cannot speak to or of a companion without reference to the currently-accepted view of his circumscribed cosmos—he cannot say “brother,” but must say my “elder brother,” or use some other term implying relative position of several individuals to himself, and among each other as reckoned through himself.

Naturally the ever-present view of a self-centered cosmos finds expression throughout language and faith, and in arts and industries, as well as in social organization: Primitive language is essentially associative, abounding in numbers and genders, persons and cases, tenses and moods, in a peculiarly complex structure reflecting the egocentric habit of thought, so that primitive grammar is chaotically elaborate; and in primitive belief the individual long retains his personal tutelary or fetish, endowing it with characters revealing his own subjectivity, and only slowly rises first to the recognition of family fetishes and clan totems, and much later to that recognition of alien tutelaries which ends in pantheism. Concordantly, primitive art is conspicuously egoistic, beginning typically with the

totemic face-paint or tattoo-mark of the matron, or with the autobiographic calendar of the shaman; while the industrial devices of early culture are held to absorb and retain a part of the personality of, and indeed to become subjective appendages to, their makers and users.

So self-centered thinking is crystallized by custom, and the thought and custom interact with cumulative effect in dominating the primitive mind well into the upper strata of prescriptorial life; and numberless vestiges of egocentric cosmology cling even unto the higher phases of Aryan culture.

It cannot be too strongly emphasized that primitive thought is unlike the finer product of contemporary intellectuality: The most conspicuous differences are connected with the pervading mysticism and prevailing egoism of primitive thinkers, which are magnified in their influence by the fewness of concurrent intellectual motives; so that prescriptorial culture may justly be regarded as the outgrowth and outshowing of that mysticism-egoism which began to decline with the birth of writing yet still retains some hold on the minds of men.

III

Simple counting is an accomplishment common to men and many lower animals. The special appreciation of numbers sometimes displayed by horses, dogs, and pigs may be due to human association, while the geometric sense of the bee may be considered mechanical merely; yet the well-known ability of the crow to count (or at least to discriminate units) up to six or seven, the similar faculty of the fox, and the habits of wasps in providing fixed numbers of spiders for their unborn progeny, as well as various other examples, demonstrate a native capacity for numerical concepts on the part of birds and mammals and insects. Apparently similar is the numerical capacity of various lowly tribes of different continents: Numerous Australian tribes are described as counting laboriously up to two, three, four, or

six, sometimes doubling two to make four or three to make six, and in other ways revealing a quasi binary system, though both Curr and Conant opine that "no Australian in his wild state could ever count intelligently to 7"¹; certain Brazilian tribes are also described as counting only to two, three, or four, usually with an additional term for many; while the Tasmanians counted commonly to two and sometimes to four, and were able to reach five by the addition of one to the limital number.²

The analogy between the counting of the tribesmen and that of the animals is not so close as the bare records suggest, since the descriptions of the tribal reckoning relate to systems of vocal numeration rather than to actual ability in discrimination and enumeration; moreover, most of the tribesmen reveal the germ of notation in the use of sticks, notches, knotted cords, and the like to make tangible the numerical values, something which lower animals never do so far as known. Actually the savages, even those of lowliest culture, habitually count to or above three, as shown by the plurality of plurals and other features of their speech; and the meagerness of their numeration no more negates numerical capacity than does the absence of such systems among counting crows and foxes and wasps. Nevertheless, the comparison is instructive; in the first place, it indicates roughly corresponding ability to count on the part of higher animals and lower men; it also defines the origin of vocal numeration at the bottom of the scale of human development; and it is especially significant in demonstrating that neither the animals nor the men either (1) cognize quinary and decimal systems, or (2) use their own external organs (toes, fingers, etc.) as mechanical adjuncts to nascent notation—unless the binary numeration of certain Australian tribes is really bimanual, as W. E. Roth implies.³ Many

¹ *The Number Concept*, by L. L. Conant, 1896, p. 27; *The Australian Race*, by E. M. Curr, 1886, vol. 1, p. 32.

² *The Aborigines of Tasmania*, by H. Ling Roth, 1890, p. 147.

³ *Ethnological Studies among the North-West-Central Queensland Aborigines*, 1897, p. 2.

primitive peoples count by fingers and hands, sometimes with the addition of toes and feet, and thereby fix quinary, decimal, and vigesimal systems; but the burden of the evidence derived from animal counting and the numeration of lower savagery seems to demonstrate that these systems are far from primeval.

Simple number systems of mystical or symbolic character abound among the better-studied tribes of middle-primitive culture, including the aborigines of North America. The most widespread of the mystical numbers is four; it finds expression in Cults of the Quarters in North America, South America, Asia, and Africa, and is suggested by certain customs in Australia¹; it is crystallized in the swastika or fylfot and other cruciform symbols on every continent; and it is established and perpetuated by associations with colors, social organization, and various customs among numerous tribes. In much of primitive culture the hold of the quatern concept is so strong as to dominate thought and action—so strong as to seem wholly inexplicable save through the interwoven mysticism and egoism of the lowly mind. The devotee of the Cult of the Quarters is unable to think or speak without habitual reference to the cardinal points; and when the quadrature is extended from space to time, as among the Papago Indians, the concept is so strong as to enthrall thought and enchain action beyond all realistic motives. To most of the devotees of the quatern concept—forming probably the majority of the middle-primitive tribes of the earth—the mystical number four is sacred, perfect, all-potent, of a perfection and potency far exceeding that of six to the Pythagoreans and the hexagram to Paracelsus; they are unconscious or only vaguely conscious of any other numerical concept; and many investigators fail to discover the obverse of the quartered shield and trace the mystical figure to the subconscious Self which it invariably reflects. Yet careful inquiry shows that the cardinal points are never conceived apart from the Ego in the center; that the subjectively prepotent

¹ *The Australian Race*, op. cit., vol. I, pp. 339, 340.

part of the swastika is the intersection, or common origin, of the arms; that the four colors of brightening sunrise, and boreal cold, and blushing sunset, and zephyr-borne warmth must have a complementary all-color in the middle; that the four winds are balanced against some mythic storm-king (able to paralyze their powers in response to suitable sacrament) in or near the Middle of the world; that the sky falls off in all directions from above the central home of the Real Men; that the four termini of Papago time relate to the end of the period conceived always with respect to the beginning; that the four worlds of widespread Amerindian mythology comprise two above and two below the fate-shadowed one on which the shamans have their half-apperceived existence; that the four phratries or societies are arranged about the real tribal center; and that in all cases the exoterically mystical number carries an esoteric complement in the form of a simple unity reflecting the egoistic personality or subjectivity of the thinker. It is easier to represent the quatern concept graphically than verbally—indeed it has been represented graphically by unnumbered thousands of primitive thinkers in the cruciform symbols dotting the whole of human history and diffused in every human province, or in the form of the equally widespread but less conspicuous quincunx.

The exoterically quatern and esoterically quincuncial concept appears to mark a fairly definite phase of human development; a somewhat higher stage is marked by the use of six as a mystical or sacred number. In this stage the mythology remains a Cult of the Quarters, though the cardinal points are augmented by the addition of zenith and nadir, while a third upper-world and a third under-world are usually added. The ramifications of the concept are still more extended than those of the quatern idea, and lead to even more patent incongruities—particularly when the attempt is made to graphically depict the essentially tri-dimensional concept on a plane. Now the senary concept, like its simpler analogue, is always incomplete in itself: The six cardinal

points must be reckoned from a common center, the three under-worlds and the three upper-worlds are reckoned from the Middle world of actuality, and the six colors (e. g., of corn, as among the Zuni according to Cushing and others) are habitually supplemented by a central all-color; so that, in this case as in the last, the exoterically perfect number is esoterically perfected through the unity of subjective personality.¹ The six-cult is much less extensively distributed through history and throughout the world than the four-cult, but may be traced in different continents; and it is peculiarly meaningful in establishing that marvelous prepotency of the number-cult which, among many tribes, carried the nascent numeral system past the point at which nature strove, through obvious organic structure and algorismic order, to implant the quinary system—indeed if further evidence than that of bestial and savage counting were required to show that finger-numeration and the quinary system were not primeval, it would be afforded by the development of the senary-septenary system in so many lands.

The quaternary and senary cults illumine the binary systems prevailing among tribes still lower in the scale of intellectual development. Especially helpful is the light on the Australian aborigines, who are found thereby to exemplify what might be called a Cult of the Halves; for their binary concept of things is expressed not only by their numeration, but even more clearly by their social and fiducial systems, which, in turn, shape their everyday conduct and speech.

"The fundamental feature in the organization of the Central Australian, as in that of other Australian tribes, is the division of the tribe into two exogamous inter-marrying groups," say Spen-

¹ The perfecting of the mystical numbers four and six by the addition of unity has been recognized by many investigators, notably Powell (*On Regimentation*; 15th Annual Report of the Bureau of Ethnology, 1893-'94, 1897, p. cxvii and elsewhere), Morris (*Relation of the Pentagonal Dodecahedron . . . to Shamanism*; Proceedings of the American Philosophical Society, vol. XXXVI, 1897, pp. 179-183), and Cushing (*ibid.*, p. 185 and elsewhere).

cer and Gillin¹; and all other students of native Australian society have either been overwhelmed by an apparently irresolvable nebula of overlapping classes and sub-classes and super-classes, or have been led to a related conclusion—indeed the gordian knot of entangled relationships constituting Australian society is easily cut by the student who places himself in the position of an individual Blackfellow, and projects from Self dichotomous class-lines occasionally uniting and bifurcating in other individuals, after the manner of the dichotomous lines of Aristotelian classification and the Tree of Porphyry. The social classes, and the conduct involved in their maintenance, are fixed by a bifurcate series of ordinances, ostensibly descended from the mystical olden time, and put in the form of tabus and equally mystical mandates by the shamans. In like manner the obscure pantheon of the Australians seems to be arranged in nearly symmetric pairs; and even the individual shade (or mystical double of the person) is conceived as bipartite—e. g., among the Arunta, who designate the ghostly attendants Iruntarinia and Arumbaringa, respectively.²

Although typically developed among the Australian aborigines, the binary philosophy is by no means confined to the Austral continent and primeval culture; it existed among the Tasmanians, reappears in Africa, persists in China and Mongolia, and may clearly be traced in America, e. g., in the "Sides" forming the primary basis of society in the Seneka and other Amerind tribes; while no fiducial system is wholly free from the persistent dualism springing from binary interpretations of nature. Yet the mystical Two is no more complete in itself than the mystical Four and Six of higher culture; the primary classes or sides are perfected in the tribe both in Australia and in America, the Iruntarinia and Arumbaringa are conjoined in and non-existent apart from the personality they are held to shadow, and the mandates and prohibitions of Australian (and indeed of most other) laws are perfected

¹ *The Native Tribes of Central Australia*, by Baldwin Spencer and F. J. Gillin, 1899, p. 55.

² *Op. cit.*, p. 513.

in permissive or normal conduct; so that the exoterically binary system of thought is esoterically, or in subconscious fact, ternary.¹

The dichotomous fiducial and social structure clarifies the Australian numeral system. The abundant numerations recorded by Curr and others strongly suggest the simple binary system traced by Conant. A common form is *goona, barkoola, barkoola-goona, barkoola-barkoola* (1, 2, 2-1, 2-2) sometimes followed by "many" or "plenty" and more rarely by *barkoola-barkoola-goona* (2-2-1), though usually the table does not go beyond the fourth term, which may itself be replaced by "many." Now, examination of the numerous records shows (1) that none of the terms correspond with fingers; (2) that a very few of the terms correspond with the word for hand, such terms being three, four, one, and two in (approximate) order of frequency; (3) that a somewhat larger number of terms, chiefly three, one, and two, correspond with the words for man; (4) that a considerable number of threes and ones, with a few fours and twos, suggest affinities with obscure roots used chiefly in terms for man, tribe, wild dog, I, yes, etc.; and (5) that there is a strong tendency to limit the formal numeration to three. It is particularly noticeable, too, that certain persistent number terms are used sometimes for two and sometimes for three among numerous slightly related tribes—i. e., the term is more definitely crystallized than the concept, which oscillates indiscriminately between two and three, betraying confusion impossible to arithmetic thought. Similarly the Tasmanian numerations are binary, and without reference to finger or hand, though five sometimes appears to connote man. These features clearly indicate that the Australasians do not count on their fingers, and are without realistic notion as to the number of fingers—indeed, the Pitta-Pitta of Queensland are able to count their fingers and toes only by the aid of marks in the sand,² while the abundant Australian pictographs reveal habitual

¹ Humboldt mentions a definite "idea of the Trinity" among the southeastern Australians (*Among Cannibals*, 1839, p. 129).

² *Ethnological Studies*, by Walter E. Roth, *op. cit.*, p. 26.

uncertainty as to the number of fingers in the human hand (save where the picture is developed from a direct impression).¹

In the dearth of knowledge concerning the original or collateral meanings of the Australian number-terms, it is difficult to formulate the concept or give it graphic expression; but a suggestion of great inherent interest is found in the Shahaptian numeration, in which, according to Hewitt, the first two integer-terms are denotive or arbitrary merely, while the term for three means Middle or Middle ONE—not middle finger or middle of the hand, but apparently a general (or semi-abstract) Middle like that of the Zuni ritual; and the suggestion is enforced by corresponding expressions in Serian, Iroquoian, and some other Amerindian tongues. In the light of these analogies, the Australian thought-mode, with its numerical and social and fiducial expressions, assumes definite and harmonious shape in a binary-ternary system in which things are arranged in pairs and related subconsciously to the Ego as an interpretative nucleus.




The three number-systems pertaining to prescriptorial culture are essentially distinct from Aryan arithmetic, both in motive

¹ Suggestively analogous in form and meaning are certain South American number systems, e. g., that of the Toba, whose ordinary numeration ends with six (the term meaning also "many" or "plenty"), though Bárcena has traced it to ten. The terms are somewhat variable, and of such form as to imply actual or vestigial connotive character; as recorded by Quevedo (*Arte de la Lengua Toba*, por el Padre Alonso Bárcena . . . con Vocabularios . . . por Samuel A. Lafone Quevedo, Biblioteca Lingüística del Museo de la Plata, tomo II, 1898, p. 41) they are *nathedac*, *cacayni* or *nivoca*, *cacaymilia*, *nalotapegat*, *nivoca cacaymilia* ($2+3$), *cacayni cacaymilia* (3×3), *nathedac cacayni cacaymilia* ($1+2 \times 3$), *nivoca nalotapegat* (2×4), *nivoca nalotapegat nathedac* ($2 \times 4+1$), *cacayni nivoca nalotapegat* ($2 \times 4+2$). Now, it is noteworthy (1) that none of the terms connotes finger, hand, or man; (2) that there are alternative terms for two in both simple and composite uses; (3) that two is the most prominent factor in the composite part of the series; (4) that one of the terms for two and the term for three are closely similar, and distinguished only by inflection; (5) that the term for four apparently connotes equality (*nalotath* = equal) and declaration (*na-pega* = they say; *tena-pega* = I say, etc.); and (6) that the system is definitively not quinary or decimal. There are suggestions, both in the combinations and connotations of the terms, of two threes of ill-defined numerical character, corresponding respectively to the numerical 2 and 3; and that four is an essentially mechanical square. There are also many indications that the system is inchoate so far as the strictly numerical aspect is concerned.

and mechanism. Primarily they are devices for divination, or for binding the real world to the supernal, and it is only later or in ancillary way that they are prostituted to practical uses; yet by reason of the extra-natural potency imputed to them they dominate thought and action in the culture stages to which they belong, and profoundly affect the course of intellectual development. The three systems correspond in that each rests on an exoteric base in the form of an even number, and in that each is really governed by a half-apperceived unity, itself the reflection of the Ego; they differ in the value of the exoteric base, itself a measure of the intellectual capacity normal to the culture stage to which it pertains. The two higher systems have graphic equivalents which intensify and measurably shape their mystical potency (for the mechanical conditions attending graphic representation always interact with primary concepts in primitive thought); but the lowest and presumptively primeval system is without known graphic symbol.

Naturally, number-systems resting on inconstant and largely subjective bases are not susceptible of treatment in accordance with rational arithmetic; but the two higher systems (and probably the lowest also) are susceptible of combination in accordance with a *law of augmentation*, which is neither addition nor multiplication, but which tends to generate both; and this law of augmentation is significant (1) as indicating the evolution of number systems both mystical and rational, and (2) as a source of those vestigial features of *almacabala* still persisting in Aryan culture.

The augmentation of the widely diffused quaternary-quinary system is made clear by aid of its mechanical symbolism, which combined with the egoistic concept to shape the system. The commonest (and nearly world-wide) symbol is the cruciform figure \oplus , or the quincunx, $\cdot \cdot \cdot$. Now, magnification of the peripheral powers or objects is readily and intuitively represented by adding a line or dot to each of the four extremities of the symbol, whereby it is converted into the simple swastika $\opl�$, or $\oplus \cdot$.

Actually the figure is sometimes developed (as among the Pueblo peoples according to Cushing) by laying down four billets or arrows radiating from a fetishistic Middle toward the east, north, west, and south, and then adding, as the ritual proceeds, shorter transverse sticks touching the extremities of the four cardinal billets; the whole being done in such a manner as to harmonize ritual and symbol, and impress the former by the objective representation in the latter. In any case, the symbol is raised from its original value of $4 + 1$ to $8 + 1$; and the graphic representation accords with the shadowy concept lying behind the number-system in which the mystical Middle is persistent, and can be counted but once howsoever the value be augmented. Similarly the peripheral potencies may be multiplied by the addition of dots, as in a common form of the swastika noted by Wilson,  or ,¹ or by the development of the "meander," , which thus represent $12 + 1$, $20 + 1$, and $20 + 1$; and the augmentation may proceed indefinitely, by either mechanical or mental addition, though always in accordance with the primary principle that the Middle is reckoned but once.

The law of augmentation in the senary-septenary system is similar. When the concept is directional, as in that form of the Cult of the Quarters in which zenith and nadir are reckoned as cardinal points, the mechanical symbol is complicated and eventually modified through the difficulty of depicting tri-dimensional relations on a bi-dimensional surface. Among the Pueblo peoples

¹ *The Swastika*, Rep. U. S. Nat. Museum for 1894, p. 767. Wilson, following Max Müller and Burnouf, notes that the additional billets or bars completing the swastika proper may be turned either to right or to left (i. e., the development of the figure may be either clockwise or counter-clockwise), but properly questions whether distinct names should be given the forms. In view of the fact that habitual motions of primitive peoples are predominantly centripetal or toward the body, while the predominant motions of advanced peoples are centrifugal, it seems probable that the clockwise swastika represents the higher cultural plane (e. g., of writing toward the right), and would therefore be normal if the symbol itself were normal to advanced culture; but since the symbol pertains in all essential respects to the culture-stage characterized by centripetal hand movement, the counter-clockwise form would seem to be more fairly considered the normal one.

this difficulty is overcome by bisecting two of the quadrants in a simple cruciform symbol in such manner as to produce the asymmetric figure $\frac{1}{2}$; but the ever-acting mechanical tendency operates to produce the regular figure \ast as the applications of the systems are extended. In either case, augmentation is effected by doubling or further increasing the peripheral extremities in such manner as to produce simple hexagrams, at first irregular, $\frac{1}{2}$, and eventually regular, \odot , or \odot . The value of successive augmentations is expressed by the figures $6+1$, $12+1$, $18+1$, etc., i. e., by successive additions (mechanical or mental) to a once-reckoned Middle.

Now, comparison of these two number-systems, especially as illumined by the Pueblo method of depicting the fifth and sixth directions, indicates that the higher is produced from the lower simply by the superposition of a binary system on the quaternary system; and the inference, coupled with the patent fact that the higher base is the measure of increased intellectual capacity, seems to define the course of development of both systems. True, it is difficult for the arithmetical thinker to see how the mathematical pioneer missed the now plain road from the indefinite quaternary-quinary notion to the definite quinary concept; but the fact cannot be gainsaid that the road *was* missed by many primitive tribes of especially mystical cast of mind, and that it was found and followed only by the ancestors of the practical Arabs with their decimal system, the barefoot Mexicans with their vigesimal system, and a few other peoples of exceptionally vigorous mind. The failure to find so plain a way may be ascribed largely to the complete domination of primitive thought by mystical concepts; and it would seem to repeat the demonstration by other facts that throughout much of prescriptorial culture little if any use was made of nature's abacus, the ever present human hand—for a habit of finger-counting could hardly fail to fix the quinary system in the minds of counters able to grasp so high a number as five without aid of extraneous symbols.

The development of the senary-septenary system out of the quaternary-quinary arrangement forcibly suggests the genesis of the latter; for it is but the sum or product of binary-ternary systems superposed by almacabalic augmentation. This suggested genesis would seem to be established by the occasional advances to the higher plane attested by some of the Australian numerations, as well as by the vestiges of the binary-ternary system along various culture lines, notably the Mongolian and Aryan. The presumptively primeval system apparently arose spontaneously, and became fixed through habitual mental effort shaped less by purpose-wrought symbols than by personal and subjective associations. Analogy with the higher systems (simplified to meet the dull mentation of the Blackfellows) would indicate that their number concept might be symbolized by any regular trigram uniting the perceived pair of objects to the unapperceived Ego; but the inequality of all social pairs in the tribal organization, the ever-varying relative potency of the good and evil mysteries, the unequal rank of the two ghostly Doppel-ichen, and other facts would suggest that a better figure for the concept would be an irregular trigram. But howsoever the system be represented graphically, the law of augmentation of the two higher systems prevails, as indicated both by certain of the Australian number-terms and by Mongolian vestiges, i. e., the augmentation proceeds by successive additions to a once-reckoned Middle, yielding the values, $2+1$, $4+1$, $6+1$, $8+1$.

So it seems feasible to define an archaic almacabala, including a method of using integral numbers rather as tokens of extra-natural potencies than as symbols for natural values and combining them by a simple rule tending to develop into algorismic processes, and including also a method of representing the numerical combinations by mechanical devices tending to develop into geometric forms; the system being characterized by the method of reckoning from an ill-defined unity counted but once in each combination.

IV

The course of intellectual development defined by the three prescriptorial number-systems (2-3, 4-5, 6-7) naturally leads interest toward the inception of the number idea—a point which must always remain obscure, save as illumined by analogies with lowest men and higher animals. Now, the more intelligent feral animals and the lowest known savages are fairly comparable in their capacity for counting; they are also alike in another respect of such consequence as to shape the character of both—their lives (as Ernest Seton Thompson so well shows for the animals) are lived in the shadow of tragedies unto often early and always unnatural death. This great fact of inevitable tragedy overlays all other facts woven in the web of nascent mind; the most firmly fixed habit of lowly life is that of eternal vigilance; the ever-present thought is that of ever-present danger; the dominant motive is that of mortal fear. No line of intellectual development can be fairly traced without full recognition of the ceaseless terrors of feral life; and the primeval interpretations of environment by animals and men alike manifestly reflect their tragic experiences: The fear-born cunning of the fox engenders that care for a way of escape without which he ventures on no advance; his every intuition is molded by living realization of a two-side universe—the Danger side in van, the Safety side in rear—with Self as the all-important center; and only religious adherence to experience-shaped instincts enables him to survive and permits his tribe to increase. The sagacious crow, even in semi-domestication, constantly betrays his notion of a two-side cosmos in frequent backward glances as he surveys the novel or forbidden field in front; and he is an arrant mystic, crazed with abject terror by night, and given to the formless fetishism of hoarding uncanny things in well-hidden shrines.¹ In like manner nearly all animals, from the fiercest carnivores to the timidest herbivores, manifest constant realization of three overshadowing

¹ *Wild Animals I have Known*, by Ernest Seton Thompson, 1898, pp. 72, 83.

factors in nature as they know it—factors expressed by Danger : Safety :: Self, or by Death and Life to Self, or in general terms, the Evil of the largely unknown and the Good of the fully known coördinated in the vaguely-defined Subject of the Badness and the Goodness; and the chief social activities of animal mates and parents are exercised in gathering their kind into the brightness of the known, and educating their native dread of all outer darkness. So, too, the more timid tribesmen of different continents betray, in conduct and speech, a dominant intuition of a terrible Unknown opposed through Self to a small but kindly Known. This intuition is not born of intertribal strife, since it is strongest in those innately amicable family groups who (despite the implication of their designation) typify lower savagery, and since it is slowly modified with the rise of self-confidence among vigorous and aggressive tribes in whose minds the Good grows large with the wax of conscious power; it is merely the subjective reflection of implacable environment—yet it is vaguely personified as a grisly and horrent bestial power, flaunting specters of death by tooth and claw, by serpent venom and swallowed poison, by pitiless famine and insidious disease, by wracking storm and whelming flood, by hydra-headed chance against half-felt helplessness; and over against this appalling Evil there is a less completely personified Good reflecting the small nucleus of confident knowledge with its far-reaching penumbra of faith. Accordingly, the lowest men and the higher animals seem much alike in their interpretation of nature—both rest their deepest convictions on a two-side cosmos connected in and through a largely-passive Self.

A vague yet persistent placement of the two ever-present Sides with respect to Self is clearly displayed in the conduct of animals and men—the Evil side is outward, the Good side at the place or domicile of the individual and especially of the group, as shown by the homing instinct of the wounded carnivore, by the haste of the fire-crazed horse to meet the flames in his

familiar stall, by human and equine nostalgia, and by the barbarian longing for burial in native soil. Moreover, both animals and men reveal indications of instinctive placement of the Sides in the individual organism; and the indications consistently point to persistent intuition of Face and Back as the essential factors of Self. Yet there is a significant diversity in the assignment of the Sides of the organism to the Sides of the Good-Bad cosmos: In general it appears that among the lower and the more timid the Back stands for or toward the Evil, the Face toward the Good, and that among the higher and more aggressive the Face is set toward the danger; e. g., defenseless birds and sheep huddle with heads together, savages sleep with heads toward the fire, and timid tribesmen tattoo talismans on their backs, while litters of young carnivores lie facing in two or more directions, self-confident campers sleep with feet to the fire, and higher soldiery think only of facing the foe. The interesting and significant growth of self-confidence need not be followed; it suffices to note that the primeval concept of the organic Ego, as revealed in the conduct of animals and men, appears to be that of a Face-Back (and not bilateral) unity, with the two Sides set toward the two aspects of a cosmos conceived in fear-born philosophy.

The passage of the primeval concept of a Face-Back Ego into that notion of two cardinal points suggesting a Cult of the Halves is happily represented among those Polynesian tribes who, according to Churchill,¹ have a system of geographic coördinates dominated by two cardinal directions, primarily seaward and landward, and secondarily northward and southward, respectively; while the language and customs connote a corresponding pantheon, capriciously malevolent on the sea-side and mildly benevolent on the

¹ Personal communication. While United States Consul at Samoa, Mr Churchill collected voluminous linguistic and other data well worthy of publication, though not yet issued. Conformably, Lesson and Martinet note that in Tahiti north and south are distinguished by denotive terms bearing a suggestive relation to tempestuous and milder winds, while east and west are without denotive designations, and are indicated only by descriptive phrases (*Les Polynésiens*, vol. II, 1881, p. 314).

land-side. This system of orientation is especially significant as a link in the chain of conceptual evolution, and equally as an explanation of the persistence of quasi-binary systems throughout Polynesia and Australasia with their shorelands of antithetic potencies; and no less significant are the facts in their bearing on the question of the habitat of primeval man, or of the orarian prototype already inferred from other facts.¹ Although varying from tribe to tribe in its relation to the meridian, this nascent orientation is no fleeting figment, but a deep-laid instinct so firmly rooted as to control every serious thought and direct every vital industry; indeed the Samoans and related navigators have developed their orientation into one of the most marvelous instincts in the whole range of animal and human life, viz: a cognition of definite albeit invisible sailing paths, whereby they are able to traverse the open Pacific, far beyond sight of land, with a degree of safety nearly equal to that afforded by chart and compass.

The Polynesian orientation at once illumines the unformulated Cult of the Halves, and opens the way to an explanation of the Cult of the Quarters; for each point of the shore is necessarily defined by sea in front and land in rear, and also by strands stretching toward the right and toward the left. Moreover, assemblages of Polynesians and Australasians, like the Iroquoian tribal councils, find it convenient to arrange themselves in coördinate groups or "Sides," so placed laterally as to face a speaker at the end of the plaza or prytaneum; and there is good reason for opining that the collective habit was soon strengthened, even if it was not initiated, by the slight asymmetry of the human body whereby the left brain receives blood a little more directly than the right and gives proportional excess of strength and cunning to the right hand. The initial inequality was doubtless too slight to yield more than barely perceptible physiologic advantage to the dextral fore-limb, as Brinton and Mason and others have shown; yet it may well have sufficed to set in operation a chain

¹ *The Trend of Human Progress*, Am. Anthropol. (N. S.), vol. I, 1899, p. 423.

of demotic interactions leading to the survival of the right-handed and the extinction of the left-handed throughout the earlier eons of human development. A clue to the demotic process is easily found in widespread horror of left-handedness, especially among primitive peoples; the clue becomes definite in the light of systematic infanticide among many tribes, whereby all manner of natal deformity is eliminated; it becomes conclusive in the light of the customs of those American tribes who habitually eliminate the sinistral offspring as monsters betokening the wrath of the powers. So, apparently initiated by slight physiologic difference and unquestionably intensified by demotic selection, right-handedness became even more predominant among primitive men than among their less superstitious descendants; the dexter and dextrous hand came to be exalted in scores of languages as "The One That Knows How" or "The Wise One," while the sinister hand was degraded by linguistic opprobrium unto a symbol of evil and outer darkness. Naturally and necessarily the bilaterally symmetric division of the Ego into Right and Left fell into superposition with the antecedent Face-Back concept, and produced a quatern notion such as that expressed in the Cult of the Quarters. Happily this transition is crystallized in the language of the Pitta-Pitta of Queensland, which possesses directional inflections indicating Front and Back reckoned from the Ego; and it is especially significant (in connection with the bimanual count inferred by W. E. Roth) that the inflection for Front applies also to (right?) Side.¹ And the quatern concept, born of unrecorded myriads of experiences, is much more than an idle fantasy of kiva and camp-fire. Intensified by the strongest motives of primitive life, it doubtless attained maximum strength before writing arose to divide its functions; yet, despite the decadence of millenniums, it is still expressed in two of the strongest instincts of higher humanity—the instinct of right-handedness, and the concomitant instinct of orientation.

¹ *Ethnological Studies*, op. cit., p. 2.

Accordingly, it seems safe provisionally to trace the origin of the number concepts in the light of common attributes of animals and men, and especially in the strong light afforded by the late-studied workings of primitive minds; and the lines seem clearly to define a crude philosophy whence all almacabalic and mathematical systems have necessarily sprung.

V

The character of almacabala, and the strength of its hold on the human mind, are illustrated by numberless vestiges, mainly mystical numbers and cognate graphic symbols. The entire series of mystical numbers may readily be ascertained by juxtaposing the three almacabalic number-systems and the products of their augmentation under the almacabalic rule. They are as follows (the super-mystical numbers accentuated):

2-3- 3, 5, 7, 9, etc.

4-5- 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69, 73, etc.

6-7- 7 13, 19, 25, 31, 37, 43, 49, 55, 61, 67, 73, etc.

The vestigial uses of the binary-ternary system are innumerable. Two persists as the basis of the semi-mystical Aristotelian classification, which still exerts strong influence on Aryan thought; two is the basis, also, of the largely-mystical Chinese philosophy in which the complementary cosmologic elements, Yang and Yin, are developed into the Book of Changes¹; and it finds expression, either alone or in its normal union, in most Aryan cults. The mystical three pervades nine-tenths of modern literature and all modern folklore; it finds classic expression in the Graces and the Fates; it is particularly strong in Germanic and Celtic literature, cropping out in the conventional Three Wishes and Three Tests (a survival of the ordeal), and also as a customary charm number; and in these or related ways it persists in half the families and most of the child-groups even of this country and of today. The concept survives, also, in all manner

¹ *Chinese Philosophy*, by Paul Carus, 1898, p. 3 et seq.

of trigrams—triangles, triskellions, hearts, etc.—of mystic or symbolic character.

The quaternary-quinary system survives conspicuously in the form of graphic devices, especially the world-wide cruciform symbol, which has taken on meanings of constantly increasing nobility and refinement with the growth of intelligence. Hardly less conspicuous are the classic and later literary survivals in the Four Elements (Air, Earth, Fire, Water) of alchemistic philosophy, the Four Winds of astrology and medieval cartography, the Four Iddhis of Buddha, and the Four Beasts of Revelation and their reflections in the ecclesiastic writing of two millennia; while the survivals in lighter lore are innumerable. The system persists significantly also in its augmentals, especially nine, thirteen, twenty-five, forty-nine, and sixty-one. The numerical vestiges are naturally for the most part quaternary, since the quinary aspect is merged and largely lost in algorism.

The senary-septenary system survives as the bridge connecting almacabala and mathematics. In the graphic form it became Pythagoras' hexagram of two superposed triangles, the equally mystical hexagram of Brianchon with which Paracelsus wrought his marvels, and the sub-rational hexagram of Pascal, while the current hexagram of the Chinese is apparently a composite of this and the binary as well as algorismic systems. In the numerical form, six and (more especially) seven play large roles in lore and in the classical and sacred literature revived during the Elizabethan period; even so recently as the middle of the century the hold of the astrologic seven was so strong as to retard general acceptance of the double discovery of the eighth planet, Neptune; and equally strong is the hold on the average mind of certain senary-septenary augmentals, particularly those coinciding with the augmentals of the lower systems.

In tracing vestiges in the form of augmentals, it is clearly to be borne in mind that their significance, like that of the primary numbers, is mystical rather than quantitative, so that certain

augmental numbers possess greater vitality than others of corresponding arithmetic grade. This is especially true of the *almacabalic* doubles, notably nine as the first augmental of five and thirteen as that of seven; for in these and other cases the first augmental is commonly of opposite sign (in *almacabalic* sense) from its basis—e. g., five and seven are beneficent or "lucky," while nine and especially thirteen are maleficent or "unlucky" numbers. Moreover, there is a further mystical intensification in squares of the bases (perhaps growing out of mechanical or arithmetical superpositions on the mystical notions); and the charm seems to be still further augmented by coincidences between the several systems. It is partly through this mystical accentuation of the always mystical augmentals that such numbers as nine, thirteen, forty-nine, and sixty-one become conspicuous as factors and vestiges of *almacabala*.

Nine survives as a mystical number in the Muses of classical mythology, in Anglo-Saxon aphorisms emphasizing the vitality of the cat and the effeminacy of the tailor, and as a recurring tale in all of the superabundant Celtic lore such as that recently recorded by Seumas MacManus; it even survived in the school-books of the early part of the century in the more curious than useful arithmetic process of "casting out the nines"; and throughout the present decade the newspaper-writing jugglers with nines have found (and diffused) much mystery-tinged amusement in *almacabalic* analyses of the numbers 1890-1899.

Glaringly prominent in the mythology of the century is the bode clustering about the ill-omened first augmental of "lucky" seven; indeed it is probable that nearly half of the enlightened citizens of the world's most intelligent country habitually carry the number thirteen in their minds as a messenger or harbinger of evil. The *almacabalic* double of thirteen (which is at the same time an augmental of five) has largely lost its mystical meaning in Europe and America, apparently through friction against practical arithmetic; but it retains no little hold on the oriental mind,

and finds expression in twenty-five-fold collectives in India and China, and in a rather frequent organization of Tibetan tribes into twenty-five septs or formal social units. Eminently conspicuous in Europe and America is the mystical number forty-nine, especially when expressed as seven \times seven; for, in the belief of a large element of European population, the seventh son of a seventh son needs no training to fit himself for medical craft, while scanners of advertising columns of American newspapers may daily read anew that the seventh daughter of a seventh daughter is a predestined seeress.

Few of the larger mystical numbers have survived the shock of occidental contact; but they abound in the Orient. The coincidental-augmental sixty-one prevails in Tibet, where Sven Hedin found a lama, one out of sixty-one of coördinate rank, who professed survival for sixty-one millenniums, through a succession of exoteric deaths and esoteric reincarnations at uniform periods of sixty-one years;¹ and this odd value is explained by the designation of the sixty-first figure in the Mongolian hexagram—"The Right Way" or "In the Middle"²—which at the same time connects the Book of Changes with the nearly world-wide Cult of the Quarters and its mystical Middle. The numbers sixty-three and sixty-five are also mystical in Chinese philosophy, though their potency would seem to be dwarfed by the mechanical-arithmetical structure of the octonal square to which they have been adjusted evidently during recent centuries. Among the Hindu more or less mystical numbers abound, and many of these are found on analysis to correspond with conventional albacabalic augmentals and coincidentals; while the Buddhistic rituals and series of aphorisms often run in measures of fives, with an initial or final supernumerary—the feature being apparently fixed by a mnemonic finger-count superposed on the almacabalic system, much as the octonal count is superposed on the mystical figures in the Chinese hexagram.

¹ *Through Asia*, by Sven Hedin, 1899, vol. II, p. 1132.

² *Chinese Philosophy*, op. cit., p. 12.

Suggestive vestiges of the mystical number-groups persist widely in the form of irrational and functionless supernumeraries, such as the thirteenth loaf in the baker's dozen, the twenty-first skerret in the coster's score, the thousand-and-first night of Arabian tale, and the conventional overplus in the legal "year and a day." It is possible that the supernumerary habit was crystallized in some cases by simple object-counting so conducted as to include an additional object as a tally; but there are many indications that the habit originally sprang from almacabalic augmentation, in which the sum is always one more than the multiple. Moreover, the supernumerary habit is especially characteristic of countries and culture-stages in which mystical number-jumbles are rife.

The various vestiges (which are far too many for full enumeration) at once illumine pre-rational numeration, and establish the course of development of number concepts suggested by the customs of peoples still living in the lower culture stages; while conversely the definition of almacabala serves to explain certain curious vestiges of primitive thought prevailing even today and in the highest culture.

VI

The way from alchemy to chemistry was long and devious, as shown by a voluminous literature worth scanning only as a means of tracing the growth of knowledge; the way from astrology to astronomy was still longer and more devious, as shown by loose straws of both literature and lore; and the way from almacabala through algorism to the rational science of quantities must have been longest and most devious of all. Yet it is worth while to gather and arrange the shreds of record and tradition which alone remain to mark the original way, and to compare them with the more abundant remnants of similar lines now followed by lower races—for these shreds, scanty though they be, define the birth of science.

THE ORIGIN OF THE "BOOK OF MORMON"

BY PERRY BENJAMIN PIERCE

The Palmyra upon the title-page of the original *Book of Mormon* (plate XXX), of which an edition of five hundred copies was printed, was not that great and ancient city of Syria, the elder sister of Damascus, "Tadmor in the Wilderness," but, at the time of the publication of the work, in 1830, a small village in western New York, in the midst of the Indian country of the Six Nations, then recently opened to white settlement by people from the eastern states, and from the nearer settlements in the eastern part of the state of New York itself. It was one of the new stations on the popular trail to the famous garden spot of the west, the wonderful Genesee country, the western Eldorado of that day and time. Only thirty years had elapsed since the beginning of the century. The wonder tales of productive soil and amazing crops had stirred all New England. The sterile acres and scanty crops of that land of the Pilgrim and the Puritan did not attract their descendants to abide at home and starve, when a few weeks or months of travel would give them possession of such fertile valleys and sun-kissed slopes as report located in the wilds of the beautiful Genesee country.

The old Surveyor General of the state of New York, who, happening to carry in his camp-outfit a copy of Lemprière's *Classical Dictionary*, bestowed out of it upon his daily work the names of all the old-world worthies, heroes, cities, towns, and countries,—Rome, Utica, Syracuse, Pompey, Homer, Manlius, Camillus, Tully, Cicero, Athens, Sparta, Troy, Ilion,—little knew when he left the name "Palmyra" upon the cross-roads on the Genesee trail that he was giving name to the locality

which future generations of men should know as the birthplace of the *Book of Mormon*, whose "author and proprietor" should be the founder of a great and wide-extending "religion" dominating the lives and actions of hundreds of thousands of men and women in the heart of a nation of many millions. And yet so it was. Palmyra was the place of publication of the Mormons' *El Koran*, the prophet Joe Smith's "*Book of Mormon*," a brief examination of which, its origin and its place in the literature of the world, it is proposed to give.

Bring to your mind's eye the place and the people. Less than thirty years of such settlement on the frontiers of civilization, at that time, had gone by. The wilderness had given way in places to farms hewn out of the primeval forests, and villages had sprung up with schools, churches, and post-offices,—not, however, as they exist in this day of rapid transit and swift news transmission; for in 1806 it took a month and cost a dollar to carry a letter by mail from Boston to Cincinnati. The people were not endowed with the goods of this world: they had, indeed, like all settlers in a new territory, gone to the new land to accumulate for themselves and their posterity what they had failed to win in their old homes in the east. And there were no foreigners to influence their civilization. The Irish were still in Ireland; the Germans had not arrived; the French in the New World were all in Canada and Louisiana.

And so it came to pass that the few hundred settlers who had established their homes in the new land in Ontario county,¹ New York, were a homogeneous people, mostly from the nearer New England states. The characteristics of the domestic and religious life of New England were all strongly developed in the new colony. The leading families were there,—the lawyer,

¹ Ontario county originally extended to the lake of the same name. In 1823, however, the State Legislature erected the northern portion into a new county and gave it the name of Wayne, in commemoration of the distinguished Revolutionary soldier. Palmyra is its county seat.

the doctor, the minister, and those who with them made up the social life of the community. The hard-working tiller of the soil was largely predominant. There was, however, in the new and crude organic union of the forces of civilization, but very narrow space for the idle, the indolent, the ne'er-do-well, whose instincts ever lead him far from the exercise of that energy which lies at the base of all ambition to climb the ladder of life. His presence in the midst of such a community was at once known and resented. He was not welcome. He had nothing to part with which was of value to those to whom he might offer it. His name was known to his neighbors, and his secret life could not be hidden. If he toiled not, and had no income, the question, How does he live? was not long in receiving an answer in such a community as this.

To Palmyra came from Windsor county, Vermont, in 1815, a middle-aged farmer named Joseph Smith, with his wife and a large family of children. They settled on a tract of land in the southern part of the township near the adjoining township of Manchester. The years passed by, but the family did not prosper; the woods were not chopped down; the soil was not tilled; the crops did not grow. The children did, however, for in that land no one ever suffered for lack of food. The boys grew up without desire for education; if they were sent to school, their days were passed in the woods with guns and dogs. The father, with native Vermont shrewdness, was a hunter and trapper before them, and soon knew the haunts of all the wild game of the country, as well as its natural scenery. If the Smiths' crops failed to come to a harvest for lack of care, the family did not allow that to interfere with their means of living. Their neighbors were always well supplied, and "borrowing" was always possible.

One of the sons of this family was Joseph Smith Jr. He was born in Sharon, Vermont, December 23, 1805, and was, therefore, in his tenth year when his father emigrated to Ontario

county, New York. And in this environment grew up the "author and proprietor" of the *Book of Mormon*.

A French writer, not long ago, having occasion to criticize the English people from the French point of view, exclaimed: "What a wonderful people those English are! They have invented fifty religions and not one gravy!" Have the descendants of the English, in crossing the seas, changed the traditions of the race? Is not the invention of "religions" still going on, with as much prospect of continuance in Greater Britain as in Great Britain itself?

The *Book of Mormon* was printed in 1830. Joseph Smith Jr was at the time twenty-four years of age. He was, according to some authorities, unable to read or write; by others it is asserted that while able to read and write to some extent he did so with difficulty. By no authority is it contended that he was in any respect more than very poorly educated. And yet, in this publication, we have a work of the greatest anthropological, ethnological, and archeological interest, struck off in one complete, full, perfect act, at the hands of an uneducated, uncultivated, country boor of equivocal reputation and low origin. It is not, like the Christian Bible, the product of fifteen centuries of growth, a fabric woven together out of the shredded history of many races, nations, and tongues, and at the hands of a hundred writers strung along the centuries over a period of time almost inconceivable in duration. On the contrary, this *Book of Mormon* purports to be a record delivered to Joseph Smith Jr when he was in a vision on September 21, 1823, at the age of eighteen years, by an angel of God, named "Moroni," said record being, in the words of the author—

a book deposited, written upon gold plates, giving an account of the former inhabitants of this continent and the source from whence they sprang. . . . He also said that there were two stones in silver bows (and these stones fastened to a breastplate, constituted what is called the Urim and Thummim,) deposited with the plates, and the

possession and use of these stones was what constituted seers in ancient or former times, and that God had prepared them for the purpose of translating the book. . . . Again, he told me that when I got those plates of which he had spoken,—for the time that they should be obtained was not yet fulfilled,—I should not show them to any person; neither the breastplate with the Urim and Thummim; only to those to whom I should be commanded to show them. If I did, I should be destroyed. While he was conversing with me about the plates, the vision was opened to my mind, that I could see the place where the plates were deposited, and that so clearly and distinctly that I knew the place *again* when I visited it.—*Times and Seasons*, Vol. III, p. 729.

These are Smith's own words. But, while the vision transpired September 21, 1823, and he went directly to the hillside situate between the townships of Manchester and Palmyra, and discovered therein the gold plates lying in a stone box, he was not permitted by the angel to take the plates into his possession until the lapse of the full period of four years, viz., until September 22, 1827. During these four years he was preparing himself for his future work, having married Miss Emma Hale, January 18, 1827, as one of the final steps of such preparation. Having received the plates from the angel, he was now enabled to set to work as prophet, seer, and interpreter, with his Urim and Thummim breastplate, to translate the symbols to his clerk, Oliver Cowdery, who prepares the manuscript from which the *Book of Mormon* is to be printed.

But no eye save his own may behold the golden leaves of this mystic book; they are kept locked in a trunk, and the trunk and Smith are screened from all inspection behind a curtain during the hours of inspiration and dictation. How this was arranged in the *res angusta domi* of the populous Smith family, now enlarged by the addition of another wife for another son, we are not told. It was known in the community that all the Smiths dwelt together in a common log-house, not very large, and containing not more than two rooms with a loft. Surely, never was heavenly revelation accompanied by greater earthly deprivation.

In the meantime, the community at large, actuated by those characteristic impulses which had accompanied its individuals from their old domiciles in New England, had scented the rumor that "old Joe Smith's Joe" was "getting up"—had indeed gotten up—a new Bible. We may be sure that current gossip was not slow in its endeavors to probe the mystery of such a rare report.

In 1861 I visited the site of the hill out of which the alleged "plates" were allegedly taken. Over thirty years had then passed since the new religion had been launched and the *Book of Mormon* given to the world. But the country neighborhood still had, at that time, many living people who, while they cared very little for "Mormonism," had a very definite remembrance of the Smith family,—father, mother, and sons. I talked with men who were contemporaries of the boys,—“went to school” with them, as they phrased it, always qualifying the statement by the additional one, as one old farmer put it: “None of them Smith boys ever went to school when they could get out of it.” Indeed, I found no person willing to say a complimentary word of any member of the Smith family.

The hill from which the “plates” are said to have been taken is a gentle elevation (not unlike many others in that part of the state of New York), of limestone formation, smoothly rounded, and cultivated over its entire surface, barring a small chestnut grove, which, when I saw it, covered a portion of its greatest elevation. The *Book of Mormon* is authority for the statement that there are many more plates “hidden up”—plates not yet revealed to the eye of mortal man. If these plates are in such hillsides as those in the township of Manchester, New York, they are most effectually “hidden up”; for there are thousands of just such likely hillsides all over the state.

But let us return to the manuscript, which in some way has fallen into the hands of the “author and proprietor” at some date prior to 1830. In that day, as in this, it takes money to pay

the printer, even though the printer be a "scrub" and does not have a trades union to see to it that the pay is always forthcoming. The manuscript is complete; the plates have been "shewn" unto the eight witnesses and handled with their hands, and the same eight witnesses have "hefted" the plates and seen the engravings thereon, all of curious workmanship and of the appearance of ancient work—but there is no money in the Smith family to pay the printing bills. There is a little printing office in Palmyra, but no angel can be invoked to subsidize the printer. The gold plates might have been an acceptable equivalent for the work done, but they could not be thus utilized, for they had been "hidden up" again, as soon as they had been translated.

Finally, a convert to the new faith is found in a well-to-do farmer, Martin Harris, who, having been in succession a Quaker, a Baptist, a Presbyterian, a Redemptorist, and last of all a Universalist, now becomes security for the publication of the manuscript, and lo, we have the *Book of Mormon*! Of this edition five hundred copies were issued and the propaganda was started. The breastplate, with its Urim and Thummim attachment, was miraculously provided as the instrument through which the prophet, seer, and interpreter should translate the Adamic characters on the golden plates into the English tongue. Notwithstanding this divine instrument, a more than accidental trace of the vernacular of the backwoods of western New York is found on every page of the work. Solecisms which would delight the heart of the modern dialect writer crop out in every sentence. In turning the leaves a well-nigh new orthography stares the reader in the face. Out of its 588 pages I venture to assert that barely one is free from one or more cacographic examples.

And that the Urim and Thummim breastplate did not aid the grammarless translator, or his uninspired amanuensis, or even his village printer, is evident from such eccentric irregularities and bold departures from the "well of English undefiled" as:

"*thou remembereth*" (page 27); "and I have *not* written *but* a small part of the things I saw" (page 35); "therefore they did not look unto the Lord as they *had* ought" (*ibid.*); "and the Devil is the *preparator* of it" (page 38); "and it came to pass that I did make tools out of the ore which I *did* *molton* out of the rock" (page 43); "and upon the plates which I made, I *did* *engraven* the record of my father" (page 50); "I can *not* write *but* a little of my words" (page 129); "and it came to pass that the servant of the Lord of the vineyard *done* according to the word of the Lord" (page 132); "he had *somewhat* contentions among his own people" (page 152); "and this he *done*" (page 225); "and the words of Amulek which *was* declared unto the people" (page 245); "now the object of these lawyers *were* to get gain" (page 251); "if it were possible that our first parents could have *went* forth" (page 257); "that there might *not* be *no* *more* sorrow upon all the face of the earth" (page 303); "O ye *had* ought to begin to howl and mourn" (page 431); "Behold I *were* about to write them all which were *engraven*" (page 506); "Stabbed by a garb of secrecy" (page 431).

I pause, out of breath, with this result of a most cursory inspection of the inspired pages under examination. I have before me, however, a work prepared by Lamoni Call, Bountiful, Utah, compiler of *The Gospel in a Nut Shell*, August, 1898, containing a list of over three thousand changes, found in the *Book of Mormon* of the latest edition, from the text as printed direct from the manuscript furnished the printer in 1830.

The Mormons have from the first repudiated with great intensity of feeling the Gentile charge that their book is but an illiterate plagiarism of a parodic romance on the Old Testament written as a literary diversion in the early part of this century by a superannuated Congregationalist minister, Rev. Solomon Spalding, entitled *The Manuscript Found*. One of their best writers has devoted great pains in the preparation of a book with the title *The Myth of the Manuscript Found*, wherein to prove that

there could be no possible connection between *The Manuscript Found* and *The Book of Mormon*.

While I believe the evidence to be overwhelming, and that it establishes beyond the shadow of a doubt the fact that, had Spalding's romance never been written, Joseph Smith Jr would never have found the box of plates in the Manchester hillside, I do not propose to rest my present examination on this contention. It is my purpose to base the examination on the *Book of Mormon* itself, as it stands in the original edition, direct from the hand of its "author and proprietor," Joseph Smith Jr.

To open this examination, let us call as first witness, Elder George Reynolds, the distinguished Mormon author of *The Myth of the Manuscript Found*, who, in establishing the veracity of the translation of the prophet, seer, and interpreter, thus testifies (pages 58-59 of his work):

In March, 1881, two gentlemen, named Kelley, residing in Michigan, for their own satisfaction visited the neighborhood where Joseph spent his youth and questioned the older residents who were acquainted with the Smith family as to their knowledge of the character of Joseph, his parents, and his brothers and sisters. Their interviews with numerous parties who claim to have known Joseph were afterwards published.

We here append a few extracts from these interviews.

"What did you know about the Smiths, Mr. Gilbert?"

"I knew nothing myself; have seen Joseph Smith a few times, but not acquainted with him. Saw Hyrum quite often. I am the party that set the type from the original manuscript for the Book of Mormon. They translated it in a cave. I would know that manuscript to-day if I should see it. The most of it was in Oliver Cowdery's handwriting. Some in Joseph's wife's; a small part though. Hyrum Smith always brought the manuscript to the office; he would have it under his coat, and all buttoned up as carefully as though it was so much gold. He said at the time that it was translated from plates by the power of God, and they were very particular about it. We had a great deal of trouble with it. It was not punctuated at all. They did not know anything about punctuation, and we had to do that ourselves."

"Well; did you change any part of it when you were setting the type?"

"No, sir; we never changed it at all."

"Why did you not change it and correct it?"

"Because they would not allow us to; they were very particular about that. We never changed it in the least. Oh, well; there might have been one or two words that I changed the spelling of; I believe I did change the spelling of one, and perhaps two, but no more."

"Did you set all the type, or did some one help you?"

"I did the whole of it myself, and helped to read the proof, too; there was no one who worked at that but myself. Did you ever see one of the first copies? I have one here that was never bound. Mr. Grandin, the printer, gave it to me. If you ever saw a Book of Mormon you will see that they changed it afterwards."

"They did! Well, let us see your copy; that is a good point. How is it changed now?"

"I will show you (bringing out his copy). Here on the title page it says (reading), 'Joseph Smith, Jr., author and proprietor.' Afterwards, in getting out other editions, they left that out and only claimed that Joseph Smith translated it."

"Well, did they claim anything else than that he was the translator when they brought the manuscript to you?"

"Oh, no; they claimed that he was translating by means of some instruments which he got at the same time he did the plates, and that the Lord helped him."

Here, then, we find in 1881, still living in the neighborhood where Joseph spent his youth, the very person who in 1829-30 "set the type from the original manuscript for the Book of Mormon." This is a credible witness, put on the stand by the defendant in the case of *The Manuscript Found*, by Solomon Spalding, versus *The Book of the Mormon*, by Joseph Smith Junior, "author and proprietor." His testimony is worth noting. After the lapse of fifty-one years the old journeyman printer states: "I would know that manuscript today if I should see it." His memory is good. His eye brightens as his mind goes back to those early days in the little printing office out in the backwoods of western New York. One can see his face shine with his remembrance of the times when Hyrum Smith always brought the manuscript to the office, under his coat, "all buttoned up as carefully as though it was so much gold." And, then, his

mind's eye sees the manuscript, over which he had so labored, once more before him; and he adds, reflectively: "We had a great deal of trouble with it. It was not punctuated at all. They did not know anything about punctuation, and we had to do that ourselves."

Did Elder George Reynolds know what a providential witness for the truth this old printer was, in this testimony, delivered fifty-one years after the events described? His were the nimble fingers that set all the type of the entire book; and no changes from the manuscript were made, "because they would not allow us to"; although he adds, as if remembering all the sins of orthography upon its head, and wishing, like a good printer, to charge them to "copy," "there might have been one or two words that I changed the spelling of, but no more." And, then, he produces his own unbound copy of his work, done fifty-one years before, to show that he had kept his eye upon the changes that "they" had afterward made, noting in particular the change on the title-page, wherein "author and proprietor" had disappeared to make way for the new claim, "Translated by Joseph Smith Jun."

With this evidence (volunteered by the defense) well in mind, showing beyond a doubt that the *Book of Mormon*, as printed in Palmyra in 1830, is a true copy of the manuscript furnished the printer, let us see, from the same evidence, the exact way in which this manuscript was produced. We will call the same witness again, Elder George Reynolds, page 71 of *Myth of the Manuscript Found*, wherein, under the heading: "Time Occupied in Translating the Book of Mormon," he says:

Objection has been made to the divinity of the Book of Mormon on the ground that the account given in the publications of the Church of the time occupied in the work of translation is far too short for the accomplishment of such a labor, and consequently it must have been copied or transcribed from some work written in the English language, most probably from Spalding's 'Manuscript Found.' But at the outset it must be recollected that the translation was accomplished by no common method, by no ordinary means. It was done by divine aid.

There were no delays over obscure passages, no difficulties over the choice of words, no stoppages from the ignorance of the translator; no time was wasted in investigation or argument over the value, intent or meaning of certain characters, and there were no references to authorities. These difficulties to human work were removed. All was as simple as when a clerk writes from dictation. The translation of the characters appeared on the Urim and Thummim, sentence by sentence, and as soon as one was correctly transcribed, the next would appear. So the enquiry narrowed down to the consideration of this simple question, how much could Oliver Cowdery write in a day?"

Martin Harris, the first convert outside the Smith family, the farmer who, as Quaker, Baptist, Presbyterian, Redemptorist, and Universalist in rapid succession, and now, as Mormon, stood to "pay the printer," the man who knew as much about the process work out of which the *Book of Mormon* came (other than the prophet Joseph himself), as any living person, is thus quoted by the same witness, Elder Reynolds (page 91 of *Myth of the Manuscript Found*):

He said that the Prophet possessed a seer stone, by which he was enabled to translate as well as from the Urim and Thummim, and for convenience he then used the seer stone. Martin explained the translation as follows: By aid of the seer stone, sentences would appear and were read by the prophet and written by Martin, and when finished he would say, "Written," and if correctly written that sentence would disappear and another appear in its place, but if not written correctly, it remained until corrected, so that the translation was just as it was engraven on the plates, precisely in the language then used."

Thus far witness Elder George Reynolds. Now let us summon another, one M. T. Lamb, who in his work *The Golden Bible* (page 241), thus quotes David Whitmer's description of the process of inspired book-making. It will be remembered that David Whitmer was one of the "three witnesses" to the Book, the other two being Oliver Cowdery and Martin Harris.¹ Whitmer testifies:

¹ "THE TESTIMONY OF THREE WITNESSES.—Be it known unto all nations, kindreds, tongues, and people, unto whom this work shall come, that we, through the grace of God the Father, and our Lord Jesus Christ, have seen the plates which

"After affixing the magical spectacles to his eyes Smith would take the plates and translate the characters one at a time. The graven characters would appear in succession to the seer, and directly under the character, when viewed through the glasses, would be the translation in English."

We will now call another witness, no less than the famous congressman-elect from Utah, Mr B. H. Roberts, who, in his *Brief History of the Church* (page 28), thus testifies :

The following is the manner in which it is said the Book of Mormon was translated : "The Prophet, scanning through the Urim and Thummim the golden pages, would see appear, in lieu of the strange characters engraved thereon, their equivalent in English words. These he would repeat, and the scribe, separated from him by a veil or curtain,

contain this record, which is a record of the people of Nephi, and also of the Lamanites, his brethren, and also of the people of Jared, which came from the tower of which hath been spoken ; and we also know that they have been translated by the gift and power of God, for his voice hath declared it unto us ; wherefore we know of a surety, that the work is true. And we also testify that we have seen the engravings which are upon the plates ; and they have been shewn unto us by the power of God, and not of man. And we declare with words of soberness, that an Angel of God came down from heaven, and he brought and laid before our eyes, that we beheld and saw the plates, and the engravings thereon ; and we know that it is by the grace of God the Father, and our Lord Jesus Christ, that we beheld and bear record that these things are true ; and it is marvellous in our eyes : Nevertheless, the voice of the Lord commanded us that we should bear record of it ; wherefore, to be obedient unto the commandments of God, we bear testimony of these things.—And we know that if we are faithful in Christ, we shall rid our garments of the blood of all men, and be found spotless before the judgement seat of Christ, and shall dwell with him eternally in the heavens. And the honor be to the Father, and to the Son, and to the Holy Ghost, which is one God. Amen. OLIVER COWDERY, DAVID WHITMER, MARTIN HARRIS."

"AND ALSO THE TESTIMONY OF EIGHT WITNESSES.—Be it known unto all nations, kindreds, tongues, and people, unto whom this work shall come, that Joseph Smith, Jr. the Author and Proprietor of this work, has shewn unto us the plates of which hath been spoken, which have the appearance of gold ; and as many of the leaves as the said Smith has translated, we did handle with our hands ; and we also saw the engravings thereon, all of which has the appearance of ancient work, and of curious workmanship. And this we bear record, with words of soberness, that the said Smith has shewn unto us, for we have seen and hefted, and know of a surety, that the said Smith has got the plates of which we have spoken. And we give our names unto the world, to witness unto the world that which we have seen ; and we lie not, God bearing witness of it. CHRISTIAN WHITMER, JACOB WHITMER, PETER WHITMER, JR. JOHN WHITMER, HIRAM PAGE, JOSEPH SMITH, SEN. HYRUM SMITH, SAMUEL H. SMITH."

would write them down. . . . Until the writing was correct in every particular, the words last given would remain before the eyes of the translator, and not disappear. But on the necessary correction being made, they would immediately pass away and be succeeded by others."

Thus far we have had Mormon witnesses only. They testify to the current Mormon belief of the origin of the manuscript from which the *Book of Mormon* was printed. An anti-Mormon writer, Dr Wyle, in his work, *Mormon Portraits* (page 203), quotes the death-bed statement of Emma Hale Smith, who, it will be remembered, became the prophet's first wife, in the year the angel permitted him to dig up the plates, as the latest step, the prophet stated, in preparation for his future work. This death-bed statement was made to her son Joseph, as follows:

"In writing for your father I frequently wrote day after day, often sitting at the table close by him, he sitting with his face buried in his hat with the stone in it."

Another anti-Mormon statement is taken from Kidder's *Mormonism and the Mormons* (page 32), published in 1842. It is here given because it reflects the origin of the Book as told by Isaac Hale, father of Mrs Emma Hale Smith, Joseph's first wife. The statement is as follows:

The manner in which he pretended to read and interpret, was the same as when he looked for the money diggers, with the stone in his hat, and his hat over his face, while the book of plates was at the same time hid in the woods.

The picture of the prophet at work, thus drawn by his wife and by her father, in the privacy of the domestic circle, is startlingly graphic. Being members of the family, we are bound, however, to accept their testimony as that of peculiarly well qualified witnesses. That Joseph laid great stress upon his "Urim and Thummim" stone, sometimes called a "seer stone," all witnesses agree. Elder Reynolds, the witness put forward by the

Mormons themselves, is clear and without any ambiguity in his evidence on this point.

Now, having uncontradicted testimony as to the exact *modus operandi* whereby the world became the possessor of the original *Book of Mormon*, let us try to understand why a God, wholly capable of making such a wonderful revelation to mankind, should so bring it to pass that, having chosen His own agent, an admittedly uneducated youth, and having fully equipped him with mechanical appliances for translating from the Adamic characters on the golden plates into the common English tongue, by means of which appliances all human tendency to error should be absolutely eliminated,—by means of which, as the witness Reynolds states,—

there were no delays over obscure passages, no difficulties over the choice of words, no stoppages from the ignorance of the translator, no time wasted in investigation or argument over the value, intent or meaning of certain characters, and there were no references to authorities,

—let us try to understand, I repeat, why such an omnipotent and omniscient God should produce a work that, in less than threescore years, should have to receive in successive editions more than three thousand corrections in orthography and grammar! Why should such a God show such illiteracy? Elder Reynolds testifies,—let us recall him—

All was as simple as when a clerk writes from dictation. The translation of the characters appeared on the Urim and Thummim, sentence by sentence, and as soon as one was *correctly transcribed* the next would appear.

It thus appears that Smith was amanuensis only; the mistakes, all and each, were God's! Necessarily so; for Reynolds testifies that Martin Harris, the man who was Smith's first convert, was present and saw as much of the process work as God designed man—other than His prophet Joseph—to see during that time. And yet Harris, in his testimony, says: "By aid of

the seer stone, sentences would appear and were read by the prophet and written by Martin, and when finished he would say, 'Written,' and if correctly written, that sentence would disappear and another appear in its place; but if not written correctly *it remained until corrected*, so that the translation was just as it was engraven on the plates, precisely in the language then used."

These three thousand changes, then, are not typographical corrections. Comparison of the first edition with the latest shows that the pronoun "which" in the first is changed to *who* in the latest, over seven hundred times. The word is constantly found, in the first edition, in such sentences as: "Those men *which* we sent." "And those men *which* had been selected." "My men *which* had been wounded." "Our brethren *which* were slain." Seven hundred printer's errors in the illiterate use of the one word "which" for the relative pronoun *who* in a single volume! And yet Joseph, who was without knowledge of grammar, did not have the slightest option in selecting the words. The English words of the translation, every one of them, were set forth upon the golden page "in lieu of the strange characters engraved thereon," says the Hon. B. H. Roberts. These words Joseph would repeat, and the scribe, cut off from the prophet and his plates by a veil or curtain, would write them down. And so potent was the Urim and Thummim, that, *not until the writing was correct in every particular*, would the word last given yield place to its successor! Here, indeed, God took no chances for error. Here, indeed, do we find an inerrancy which is not indictable. And yet, if this be true, the original *Book of Mormon* indicts the latest edition of the *Book of Mormon*, published in Salt Lake City, Utah, in 1891, by Geo. Q. Cannon & Sons Company, in that the said infallible first edition thus infallibly prepared, has been subjected to more than three thousand alleged "corrections"! Is it credible that God, after taking such excessive pains to compel an illiterate man to transmit, without error, so

wonderful a revelation to the wicked world, notwithstanding his illiteracy, should yet lay Himself open in later editions to such a multiplicity of "corrections"?

Let us see if we can explain why the word "which," for example, was used seven hundred times instead of the word *who*. Let us suppose, for the sake of argument only, the *Book of Mormon* to have been written by an impostor, of illiterate mind, yet who had an ear attuned to "revival Bible-readings," such as the new settlements in western New York were familiar with in the first quarter of this century. What would be more natural to such an impostor than ignorance of the fact that, in the days when King James' version was made, the word "which" was commonly used as referring to *persons*, but that after the lapse of more than two hundred years the word had in actual usage come to be universally employed as referring only to *things*. If such a person should undertake to originate a work like the first *Book of Mormon*, to be in sound, irrespective of sense, as like the sonorous English of the seventeenth century as possible, how easily would he fall into the trap set by that innocent-looking little word "which." More than seven hundred *whiches* in the *Book of Mormon*, by actual count of Mr Lamoni Call, of Bountiful, Utah! If the prophet and his councilors had only known that the pronoun "which" in King James' time was good English when referring to persons, but that it is not good English now, nor was it good English in 1829, they would have been spared the pains of the invention of the Urim and Thummim stone, by the operation of which their God has been made to masquerade as an idiot.

Joseph and the Mormon authorities have not left themselves any loop-hole for escape; for it must be remembered that Joseph had nothing to do with the three thousand mistakes which his original *Book of Mormon* contained, and that the God of the Mormons so arranged it that Joseph could not make a mistake! Accordingly, every correction made by the latest edition is an indictment of the omnipotence and omniscience of the God of

the Mormons. He was not a backwoodsman: He should have known what Joseph did not, and should have kept, as the Hon. B. H. Roberts, member-elect of the LVIth Congress, says He could not help doing, the Urim and Thummim on the golden plates until the Day of Judgment even, rather than have permitted the first one of those three thousand and odd mistakes to find its way into the manuscript of the *Book of Mormon*, so carefully prepared and printed by the "author and proprietor" in 1830.

Let us conclude this examination with one more point of evidence taken from the original *Book of Mormon*. As the title-page shows, this book purports to be an abridgment of the records of a certain Lehi, who, with his family and certain others, people of Nephi and also the Lamanites, came from Jerusalem to America 600 B.C. They brought with them a body of gold plates containing the Old Testament Scriptures up to that time engraved thereon. These plates, of the greatest anthropological and ethnological interest, were wonderfully "hidden up" in a hillside in New York state and in due time revealed and translated by a special providence of God. So, for any portions of the Old Testament Scriptures which might happen to be contained in the *Book of Mormon*, we have a much more perfect translation than for the same portions as translated out of the original Hebrew by the rules of ordinary philology. These portions are not only better than the corresponding portions of the Bible, but they are absolutely perfect, if the Hon. B. H. Roberts is to be regarded as a veracious historian. Hence, if we wish to see how correctly the Hebrew Bible has been translated, a comparison of these parts would inform us. I quote from Lamoni Call's "Reasons for Making the Changes," (page 119):

There are thirty-eight pages in the Book of Mormon which are also in the Bible. Six and one-half of these are the sermon on the mount, which Christ delivered in America almost exactly as he did in Jerusalem. The third and fourth chapters of Malachi He quoted to them;

making eight and one-half pages from the Son of God direct. The other twenty-nine and one-half were taken from the golden plates, engraved thereon by the various writers.

Now, is not this a remarkable *contretemps*? These plates, brought over from Jerusalem 600 B.C., had the Sermon on the Mount engraved thereon in Adamic characters six centuries before it was delivered on the hills of Galilee. The *Book of Mormon* presents it in almost the same words in which it appears in King James' version. The Urim and Thummim made here no mistake. The "seer stone" did its infallible work when it translated from the plates whole chapters having their counterparts in King James' version! The fifth chapter of Isaiah is found on page 90 of the *Book of Mormon*. In the King James version we find, (verse 10): "Yea, ten acres of vineyard shall yield one bath, and the seed of *an homer* shall yield an ephah." The *Book of Mormon* says: "Yea, ten acres of vineyard shall yield one bath, and the seed of *a horner* shall yield an ephah."

Lamoni Call, the Mormon teacher at Bountiful, Utah, in his above-cited work, published in August, 1898, says (page 122), of this apparently simple mistake in typography, that it—

tells a big story to a printer. It is the change of "horner" to "homer." If the truth could be learned, I would bet all the old jack knives I had when I was a boy that I can now find, against anything you have a mind to put up, that *the Bible Joseph had behind the curtain* had a nicked "m," so that it looked somewhat like "rn." The word may have looked not very unlike "homer" [*horner* ?].

This, then, is what the *Book of Mormon* is, when interpreted by the light shed upon it by the Mormons themselves. It will be noted that not a word of accusation has been taken from their enemies. I have brought against it that legitimate criticism only which any book purporting to be of divine origin must be able to successfully confront. The well known rule, *falsus in uno, falsus in omnibus*, applies. In this instance, indeed, the rule might well be reversed—*falsus in omnibus, falsus in uno*.

To follow the imposture thus sought to be foisted upon the world into practice and trace out the conduct of life which acceptance by its adherents must necessarily induce, though a most interesting branch of the subject, is beyond the scope of the present purpose. Not, however, necessarily because of the meanness of its origin is the Book to be condemned. But danger awaits any community whose individuals, after fully realizing what a monster of iniquity and deceit the Book is, still adhere to its teachings and its precepts merely because those teachings and precepts are not in themselves immoral. For, the *Book of Mormon* is not in itself immoral. There is no polygamy in it. On the contrary, it is expressly prohibited. The Mormons have been slandered and traduced, unjustly and without warrant, for an immoral "Bible." Whatever their practices may be under their doctrine of "a new revelation," however, which springs directly from their invention of the *Book of Mormon* itself, there is nothing immoral in the book. It is, on the contrary, only grotesque. It is a melange of plagiarisms from the Old and New Testaments, without order or regularity, easily traced, and intermingled with watery parodies of nothing in particular, signifying nothing. But, in this monstrosity, born of deceit and bred in falsehood, obliged to defend itself and its origin with inventions claiming miraculous interpositions of divine power, its adherents have discovered a most dangerous weapon against the moral world in this doctrine of "a continuing revelation." A hierarchy of subtle brains equipped with the wealth of the entire community, reinforced with a million dupes, willing to accept with unquestioning obedience any dispensation formulated in the terms of "Thus saith the Lord," is a portentous danger-sign to enlightened civilization. This is the menace to the world from Mormonism.

SOCIOLOGY, OR THE SCIENCE OF INSTITUTIONS

(Concluded)

By J. W. POWELL.

HISTORICS

Historics is the science which records events of social life and shows the relation existing between social causes and social effects. A mere record of events is usually called annals, and furnishes the data for history. Only the history of peoples is usually called history, the history of individuals is usually called biography; but as we wish to include history and biography in the science which we are to characterize we shall call it historics, meaning that history and biography are included therein. We shall divide the periods or stages of social history into savagery, barbarism, monarchy, and democracy.

SAVAGERY

To the ethnologist a savage is a forest dweller. In common conception the savage is a brutal person whose chief delight is in taking scalps. Sometimes the sylvan man is cruel,—but even civilized men are sometimes cruel. Savagery is a status of culture to the ethnologist, who recognizes four such stages, of which savagery is the lowest. Some of the Amerindian tribes belong to this lowest stage; while others belong to a higher stage which is called barbarism. Wishing to show my readers how a savage tribe is governed, I must at the outset ask them to consider the savage not as a man of cruelty, but as a man who takes part in a regularly organized government, with laws that are obeyed and enforced. What, then, is a savage tribe, and how does tribal society differ from national society?

The nation, like the tribe, is a compound group of people, the distinction between them being in the method by which the grouping is accomplished. All the people of the United States belong to the national group. They are citizens of the nation, and, at the same time, are divided into forty-five groups as citizens of states. In every state there are counties; and the people of the state are citizens of one or other of these counties. Then, again, the counties are divided into precincts, towns, or townships. Sometimes towns are divided into school-districts, and cities into wards. And there are numerous villages. Thus the people of the United States are organized in a hierarchy of groups, from the school-district to the entire nation. The territory of the United States is divided into subordinate districts throughout the hierarchy; and there are at least four groups in the hierarchy, viz., the town, the county, the state, and the nation,—or the ward, the city, the state, and the nation. Every citizen of the United States, therefore, belongs to four different organizations in a hierarchy. He has a vote in each organization, assists in the selection of its officers, obeys its laws, and holds allegiance to its authority. This is all very simple; but the plan of grouping or regimenting people by territorial boundaries is of late origin. Our Anglo-Saxon ancestors were grouped by a very different method. History teaches that the ancient Greeks and Romans were grouped by a different plan. In fact, it has been discovered that, in the two stages of culture which I have called savagery and barbarism, a very different plan of regimentation everywhere prevails. This plan is known as tribal organization.

Tribal organization characterizes the two lower stages of culture; though savage regimentation differs from barbaric regimentation in some very important particulars.

In tribal society people are grouped or regimented in bodies of kindred. Let us first examine this grouping in the savage tribe. A savage tribe is composed of clans. Let us obtain a clear idea of what is meant by a clan.

A tribe is a group of people composed of clans; a clan is a group of people having a common name. Suppose that a tribe springs from four persons, viz., a brother and a sister belonging to one clan, and a brother and a sister belonging to another clan, and that each of the men marries the other's sister. Let us call one of our clans "Wolf," and the other "Eagle." The Wolf man marries the Eagle woman; and the Eagle man marries the Wolf woman. This is the first generation of a tribe composed of two clans, the man and his wife belonging to different clans. The four persons belong to two clans, and constitute two families. Let us suppose that each couple has four children, two boys and two girls. They will belong to two clans. The children of the Wolf mother will belong to the Wolf clan, and the children of the Eagle mother to the Eagle clan, for the children take the name of the mother. This is the second generation. Then four people of the second generation and two of the first generation belong to the Wolf clan; and four of the second generation and two of the first generation belong to the Eagle clan. Thus we see that clans do not correspond to what we call families. The husband and wife belong to different clans; and the children belong to the clan of the mother, and take the name of the mother. The mother, not the father, owns the children; and the husband is but the guest of his wife, not the head of the household.

Suppose that each man of the second generation marries a woman of that generation who belongs to a different clan, and that each pair has four children, two boys and two girls. These children constitute the third generation. The children belong to the clan of the mother. There are now three generations of people in each clan; and every mother claims her own children as members of her clan. The head of the family is the mother; but the head of the clan is the grandmother's brother. Always the elder-man of the clan is the ruler of the clan; and the woman is the family ruler of her children. We may go on from the

hypothetical beginning of a tribe through successive generations; and still the ruler of the clan will be the elder-man of the clan and will govern not his own children and their descendants, but his sister's children and their descendants. We may therefore define a clan as a group of kindred people whose kinship is reckoned only through females.

A clan always has a name, which is called its totem; and the object from which it is named is in like manner called its totem. Thus, in the two clans which we have considered, the wolf and the eagle are respectively called the totems of the clan. The totem derives great consideration in savage society. It is usually some beast, bird, or insect, or some important plant, such as the corn or the tobacco; or it may be the wind, the rain, a star, or the sun. The totem of the clan is considered to be the progenitor or prototype of the clan. The people of the Wolf clan claim to have descended from the wolf; the people of the Eagle clan, from the eagle; the people of the Wind clan, from the wind; and the people of the Sun clan, from the sun. The totem is also the tutelar deity of the clan.

There grows up about the clan a singular set of rules and observances which are rites on the one hand and prohibitions on the other. The prohibitions are usually called taboos. Thus, the members of the Wolf clan must not kill a wolf, as the killing of the wolf is tabooed to the clan; but if they see one they must perform some ceremony. The rites and taboos of the totem are universal in this stage of society, and are held as sacred obligations. One of these taboos is especially to be noted: A person must not marry into his own clan. The taboo is sacred; and its violation is a horrible crime, which, in some tribes, is punishable with death.

An individual is likely to have as many kindred through his father as through his mother; and he is also likely to have as many kindred through his wife by affinity as through his father and mother by consanguinity. All those persons to whom the

clansman is related through his father and through his wife, together with all the members of his own clan, constitute the tribe. Thus in savage society we have families, clans, and tribes. We have still a fourth unit. Two or more tribes may unite to form a confederacy for offensive or defensive purposes, or for both. When a confederacy is formed, artificial kinship is introduced; and the tribes which unite agree to consider themselves related. If two tribes unite, the men of the tribes may consider each other as elder and younger brothers, or as fathers and sons, or even as uncles and nephews. Where many tribes unite to form a confederacy, relationships are distributed to the members of the confederacy, but only after long conferences, where such questions are considered in detail. Thus we see that in tribal society men are not regimented or grouped territorially, as in national society, but are regimented by kinship, real or conventional as the case may be; the same end, however, is accomplished in full, that is, the people are grouped in a hierarchy of units. Thus in tribal society men are grouped or regimented by kindred; and each person belongs to at least four groups of different grades in the hierarchy. Certain things are regulated by the confederacy, certain things by the tribe, certain things by the clan, certain things by the mother of the family. In national society there is local government. In a democratic nation this is local self-government; and in a monarchical nation it is local government through officers appointed by the monarch. In tribal society there is group government, the questions of government being relegated to the several groups, and the elder-man of the group having authority.

In the course of generations some clans may die out, and the children be left without parents or grandparents: they must then be adopted into some other family. If they are adopted by a mother's sister they are still in the same clan; but if they are adopted by a father's sister they are considered as belonging to his clan, which is the same as that of his sister. It is thus that it

sometimes happens that children change clans and, consequently, their totemic names.

When the men of a clan go out to hunt or fish, to make a boat or build a house, or to do any other work together, the oldest man of the clan is the director of the enterprise, the chief. All Indians hold that superior age gives authority; and every person is taught from childhood to obey his superiors and to rule over his inferiors. The superiors are those of greater age; the inferiors, those who are younger. It is the law of tribal society that superior age gives authority, and that inferior age imposes a duty. But the people of a tribe do not know their age; for they do not keep a record of time. How, then, can they carry out this law? Well, they have a very simple device, by which every person in the clan may know that he is older or younger than other persons in the clan. Besides the totem name they have kinship names. Thus, there is a name for "father" and another for "son"; and the son always knows that he is younger than the father, and must obey him. Similarly the father always knows that he is older than the son, and that he has the right to command him. The same is true of mother and daughter. But there may be two or more brothers; so they have two names for "brother," one meaning "elder brother," and the other "younger brother." In the same manner they have two words for "cousin," one signifying "elder cousin," and the other "younger cousin." They have also two words corresponding to "uncle" and "nephew"; but the word meaning "uncle" is always applied to the elder, and the word which means "nephew" is always applied to the one who is younger. Thus in the Ute language there are two words: *ain* and *aitsen*. *Ain* applies to the one who is the elder, whether he be uncle or nephew; and *aitsen* applies to the younger, whether he be uncle or nephew.

So long as the tribesmen live together in clans they have a simple method of keeping in memory their relative ages: for the names by which they address one another always express the

difference in age; and it is a law in tribal society that one person must address another by a kinship term. He may *speak of* another by his totem name, or by any other name; but he must *address* another by his kinship name. It is always considered an insult to call another person of the same body of kindred by any name other than his kinship name. A Caucasian boy on the street may call his brother "John"; but an Amerind boy in the woods must call his brother by one of the terms which show that he is older, or younger, than himself.

The oldest man of the clan having natural authority, according to Amerindian ideas, over all members of the clan is their chief; and this is the basis of the patriarchy. A clan is said to have a patriarchal government.

Sometimes the elder-man or patriarch or chief becomes old and imbecile; or there may be another man in the clan whom they suppose to have greater ability, and they conclude to make him the chief. In such a case the law is obeyed by a plan which lawyers term a legal fiction. The new chief is promoted; and then he becomes the grandfather of the clan. If his father is still living, he is compelled to call his chieftain son "grandfather"; if his elder brother is still living he is compelled to call the chief "elder brother"; if his uncle is still living he is compelled to call the chief, "uncle." So, by this legal fiction, the chief is still the patriarch of the clan. Not only can a chief be promoted to the head of the clan, but from time to time different individuals in the clan are promoted over their fellows. A young man who proves himself to be skilful in fishing and hunting, or a brave warrior, may be promoted over his fellows, who thus become persons younger than himself and must address him as if he were older. Every year adds a new spike to the antlers of the stag. Some Amerinds call such a promotion the adding of a spike to a man's horns; other tribes speak of it as adding another stripe to his paint; and still others, as adding another feather to his bonnet. Sometimes a chief may prove to be a coward; then he will be

deposed. Or an individual may disgrace himself, when he will be reduced in rank. When a man is deposed the Amerinds will say that his horns have been knocked off, or that his paint has been wiped off, or that his feathers have been plucked.

In a similar manner tribes and confederacies are governed by reckoning kinship in different ways, and making kinship by legal fiction. All such governments are patriarchal. It will readily be seen that such government is not possible in civilized society. What man can know the names of all the persons living in a county or a state; or who can learn all the names of the people who live in a city; and how can one trace out the kinship of the people of a city into clans? Tribal society, or kinship government, is therefore impossible in civilization, and is possible only where the group of people thus united in government is very small, and the members know one another as kindred.

I have already explained the adoption into other clans of infant children whose clan kindred have become extinct. Such cases seem to be infrequent; but there are other cases of adoption which are more common. Children, and even adults, captured in war are usually adopted into some clan. Our European ancestors observed a curious custom among the tribes of this country—that of running the gantlet. A prisoner was compelled to run between two lines of his captors armed with sticks or other missiles. This was formerly supposed to be a method of torture. On investigation it is proved to have had quite another purpose. The prisoner was given an opportunity to show his mettle, his courage, and his ability to fight his way through a line of clubs. If he acquitted himself manfully, any woman among the captors might claim him for her child. Children ran the gantlet of children only; but adults ran the gantlet of men, women, and children. Female children were rarely submitted to this ordeal. The adoption of a captive was his new birth into the clan; and his official age dated from his new birth. If he proved himself skilful, useful, and

especially wise, he might be promoted from time to time, until at last the captive might become a chief.

Captives taken from tribes that are hereditary enemies and between which there have grown historic feuds, and who are held to practice monster sins, such as cannibalism, are given a fixed status from their birth into the clan, which they cannot pass without promotion; for all persons naturally born into the clan may call them younger and have authority over them. This is the primal form of slavery: but by good behavior the rules of such slavery may be greatly relaxed, and captives from hated enemies may ultimately become promoted kindred.

A person may not marry another of the same clan, but usually he must marry some one of the tribe not in his own clan. Before the marriage customs of the tribes of America were properly understood, a theory of endogamy and exogamy was developed by McLennan and others, which has played quite a role in theories of ethnology. There are a great number of languages spoken by the tribes of America; so that the terms used to signify the clan and the tribe are multitudinous. The earlier writers on marriage customs in tribal society culled from the literature of travels a vast body of stories about taboos in marriage; and it was finally concluded that certain tribes required their tribesmen to marry women who were foreigners and aliens. This was called exogamy. Then it was held that other tribes required or permitted their tribesmen to take wives within the tribe; and this was called endogamy. So an attempt was made to classify the tribes of mankind, not only in America, but elsewhere, into two groups, the exogamous and the endogamous.

Now we understand that in all tribal society there is an endogamous, or incest, group, which we call the clan in savagery, and the gens in barbarism; while, at the same time, the clansmen usually marry within the tribe by regulations which vary greatly from people to people. It seems that the ties of marriage are used to bind different peoples together in one larger group which

we call the tribe, and that the clans of a tribe may at one time have been distinct tribes; that when tribes become weak, or desire to form permanent alliances with other tribes for offensive and defensive purposes, such tribes agree to become clans of a united body, and by treaty confirm the bargain by pledging not to marry women within their own groups, but to exchange women with one another. "Give us your daughters for wives, and we will give you our daughters for wives." Such a bargain or treaty, enforced for many generations as customary law, ultimately becomes sacred, and marriage within the group is incest. Perhaps there is no people, tribal or national, which has not an incest group; so all peoples are endogamous, as all peoples are necessarily exogamous. The distinction set forth by McLennan proves to be invalid everywhere and among all peoples.

Among the tribes of America there are many marriage customs establishing the group within which a person may marry. It may be that a man may marry within any clan but his own, or it may be that a man must marry within some particular clan. Sometimes there is a series of clans, which we will call *A*, *B*, *C*, *D*, and *N*. A man of *A* must marry a woman of *B*; a man of *B* must marry a woman of *C*; a man of *C* must marry a woman of *D*, and so on; and, finally, a man of *N* must marry a woman of *A*. Tribes themselves composed of clans unite with other tribes also composed of clans; and in this consolidation into larger tribes there is found, in actual study of the Amerinds themselves, a great variety of regulations, all having the common feature of an incest group or clan, and further provision for bonds of friendship, which are perennially sealed by intermarriages. It thus happens that universally among the tribes of America marriages are regulated by customary law; and the parties married have no legal right to personal choice. Yet there are often ways established by which the clan confirms the personal choice. Though marriage is always regulated by the elders of the clan, yet they often consult the wishes of the candidates. There are

three marriage customs, springing up from time to time among the tribes, which require special mention.

A young man and a young woman may form a clandestine marriage and live apart in the forest, regardless of the consent of the elders of the two clans involved, until a child is born, provided the taboo is not violated, that is, that the two parties do not belong to the same clan.

There is another custom which the exigencies of life frequently produce. The clan of the bridegroom may have many male candidates for marriage, while the clan in which their brides are found may have few eligible women. Then the young man may wish to marry a woman in some clan other than that in which his rights inhere. In such a case the wife may be captured; but the capture is always a friendly one. If the girl has other contestants for her hand, she must be won by wager of battle. The battle is fought as a hand-to-hand conflict, without weapons other than those furnished by nature.

A third custom is found, especially on the western coast of North America, where men buy their wives. This seems to occur in the case of polygamy, where the man who takes a second or a third wife not only remunerates the woman's clan, but makes presents to certain persons throughout the tribe who might have an interest in disposing of the girl in some other way. This seems to be the case in many tribes where "potlatch" weddings are observed; and it may be true in all.

The possession of property which is exclusively used by the individual, such as clothing, ornaments, and various utensils and implements is inherent in the individual. Individual property cannot be inherited, but at death is consigned to the grave. Property which belongs to the clan, such as the house, the boat, the garden, etc., is common property. No article of food belongs to the individual, but is the common property of the clan, and must be divided by the authorities of the clan, often according to some rule by which a special portion is given to the person who

provides the food. Thus, when a hunter kills a deer, a particular portion is given to him; other portions may be given to those who assisted in its capture; and all the rest is divided according to the needs of the individuals of the clan. The women gather fruits, seeds, or roots; that which is consumed at the time is divided by like methods, but that which is preserved for future use sometimes becomes the property of the clan. The elder-man of the clan is responsible for the training of children; and it is no small part of his duty daily to exercise them in their games and to instruct them in their duties. Thus he who enforces clan custom is the same person who instructs in clan custom; and when councils of tribe or confederacy are held, he is the representative of the clan in such councils. The chief of the confederacy is usually the chief one of the tribes; and the chief of the tribe is usually an elder-man in one of the clans. There are clan councils, tribal councils, and confederate councils.

The council is the tribal court and legislative body in one. All Indian life is coöperative; and all coöperative life is regulated by the clan, the tribe, or the confederacy. The clan hunt and the clan fishing expedition are regulated by the council; and when the clan or the tribe would move the site of its village, the council must so decree and regulate the matter. The council of the clan settles disputes between individuals of the clan; the council of the tribe settles disputes between clans; and the council of the confederacy settles disputes between tribes. Sometimes the members of the clan live separately by households; but often the clan will build a council-house for all its members, when the households will be relegated to distinct sections. It is curious to see the people dissolved into households at one time, and at another aggregated in clans. If the clan moves temporarily to a favorite locality, where roots or fruits are abundant in their season, the clan may dissolve into households and provide for themselves rude shelters of bark, brush, and leaves; but if the clan wishes to change its habitation permanently, it is likely to

construct a new communal dwelling for the joint use of the members of the clan. Thus the clan seems to be the most permanent and most fundamental unit in the organization.

In the study of North American tribes it is always found that the purpose assigned and recognized for the organization of that unit is the establishment of peace. Two or more bodies go to war, and finally agree to live in peace, and make a treaty; and the terms of the treaty are invariably of one character, if they unite as a tribe. This fundamental condition for the organization of a tribe is, that the one party agrees that its women shall be the wives of the other, with a reciprocal obligation. This is the characteristic which distinguishes tribes from confederacies. A body of people organized for the purpose of regulating marriage is a tribe. A body of people organized for war is a confederacy. Thus the organization of a tribe itself is the first recognition of the principle of peace in the origin of constitutions. The confederacy is always the unit of war organization. It is doubtful—in the present stage of investigation, at least—whether a tribe, as such, ever engages in offensive war. Confederacies become tribes by customary intermarriages, especially when the tribe becomes the taboo unit of intermarriage. It is thus that the three units, the clan, the tribe, and the confederacy, are variable from time to time, although at any particular time these three units can be distinguished as well as the family or household unit.

There are peculiar circumstances under which the household unit is variable. This variability depends upon customs which sometimes spring up among tribes, and are known as polyandry and polygamy. Sometimes the man who marries a woman is entitled to marry her sisters as they become of age. There are other conditions under which men become polygamists; but they are not very common in savage society. In the same manner, there are cases in which the women of the clan are few as compared with the men to whom they are due; and, hence, one

woman becomes the common wife of several men. This is polyandry. It is not certain that polyandry has ever prevailed in an Amerind tribe; but certain forms of polyandry are found elsewhere, especially in Australia, where the clan system has an aberrant development, doubtless due to the development of many tribes of the same linguistic stock, and to the spread of the same totemic clan largely over the Australian continent.

Another organization, which involves all civic relations, must now be explained. There is a body of men (and sometimes of women also) who are known as medicine-men or shamans, and sometimes as priests, who control all religious ceremonies and who are diviners. As disease is supposed to be the work of human or animal sorcery, it is their function to prevent or thwart sorcery. They have the management of all ceremonies relating to war, hunting, fishing, and the gathering of the fruits of field and forest. It is their office to provide with ceremony for abundant harvests, to regulate the climate, and generally to divine and control good and evil. The principal shamans are men; but all the people are united into shamanistic societies. Usually there is some determined number of these societies, over each of which some particular shaman presides; and he has subordinates, each one of whom has some particular office or function to perform in the societies. Sometimes a person may belong to two or more of these societies; usually he has the privilege to join any one; and a revered or successful shaman will gather a great society, while a shaman of less influence will preside over a society more feeble.

Let us call these societies ecclesiastical corporations, and the shamans priests. The way in which they are regimented and controlled differs from tribe to tribe; and there is a great variety of ceremonial observances. In all civic councils the ecclesiastical authorities take part and have specified functions to perform; and they introduce into civic life the ceremonies which they believe will produce good fortune. Perhaps the ecclesiastical

authorities may be more powerful than the civic authorities, and the hereditary line of special ecclesiastical governors may gradually overpower the civic constitution and absorb it as a secondary element in the ecclesiastic constitution. For it must be remembered that the chief priests are men, and that the women play a very small part in ecclesiastical affairs. Now, as the men manage ecclesiastical affairs as chief priests, so civil affairs are managed mainly by men as elder-men. The conflict which sometimes arises between the two forms of government is mainly between men and men, or between able elder-men and able shamans; but sometimes both officers are combined in one person, and the great elder-man may also be the great shaman.

BARBARISM

In barbarism the tribe is composed of groups which we call gentes, and is said to have a gentile organization. Among the Romans such persons were known as agnates. A group of agnates is composed of persons who reckon kinship through males. Gentile organization is best known through the early history of the Romans and Greeks; it was well developed among the peoples of early history who spoke the Sanskrit language; it appears among the early Anglo-Saxons; a few tribes in North America have gentile organization, and it has been at one time or another widely spread throughout the earth. As a clan is a group of people who reckon kinship through females to some ancestral female, real or conventional, so a gens is a group of people who reckon kinship through males to some ancestral male, real or conventional. It seems that the primordial constitution of the tribe is by clanship and that the clanship tribe is developed into the gentile tribe. Most of the tribes of North America have clanship organization, yet there is a goodly number with gentile organization, while perhaps it may be said that a majority of the clanship tribes have some elements of the gentile organization; so that it may be justly affirmed that a great many of the tribes on this continent

are in the stage of transition, and there is scarcely a gentile tribe which has not some feature of clanship organization as a survival. But more than this—all of the tribes of North America have come into association to a greater or less degree with the European invaders, and have thus taken on some of the elements of civilized culture, so that the Columbian period has been one of very rapid development in tribal organization. Now, again and again we find abundant evidence that the savage tribe yields its peculiarities by exchanging them for barbaric characteristics. A review of the evidence which has been accumulating through a series of years on this subject demonstrates that clanship organization develops into gentile organization. To set forth in a summary manner how this development is accomplished will perhaps be the best method of explaining the nature of a barbaric government.

In savagery there are societies which are organized for the purpose of securing the coöperation of ghosts in the affairs of mankind. These societies are often called phratries or brotherhoods, and are the custodians of the lore of unseen beings. They occupy themselves with ceremonies and various practices intended to secure advantages and to avert evils which are attributed to multitudinous ghostly beings which are supposed to have tenuous bodies and to live an occult and magical life as they take part in human affairs. Everything unexplained is attributed to ghosts. The leader in these thaumaturgic societies is called by white men a medicine-man, or sometimes priest, or even a thaumaturgist; a more scientific term is shaman. The phratry over which the shaman presides has a special care of health and the occult agencies of welfare, so he presides over elaborate ceremonies which have a religious significance. These phratries, called by some of our writers societies, take a very active part in savage society, for much of the time of the people is occupied in the performance of the rites of thaumaturgy antecedent to any enterprise of importance in which the clan may engage.

These phratries which are organized to obtain the assistance of ghosts develop periodical ceremonies which are designed to secure the annual productions of nature upon which human welfare depends. Thus the fishing tribes of the Pacific coast that depend largely for their food on the coming of the salmon from the sea at stated times have ceremonies designed to secure their coming; those that depend upon cereals, like wild rice, also have their ceremonies to invoke the aid of ghosts to bring abundant seeds. In arid lands, where vegetation is so dependent upon rain, these ceremonies take the form of invocations for rain. Thus in every region of the United States periodical ceremonies are performed to secure harvests and supplies of game.

Again, human beings are subject to many diseases which are universally attributed to ghosts. Ceremonies to ghosts are common for the purpose of propitiating them or of preventing their malign influences or even of obtaining the aid of some ghosts to defend the people from other ghosts. Societies, or incorporations, as we have called them, but which are often called phratries, or brotherhoods, are first incorporated among men as religious societies on the theory that the good and evil of life are largely dependent upon ghosts.

In tribal life the head of such a society, if it be a man, is known as father; in some few cases the head may be a woman, when she is known as mother. The children of such a head of society are known as brothers and sisters, hence among classical peoples they were known as phratries.

These brotherhoods constitute an important element in savage society, and their chiefs have on some occasions quite as much influence as the governmental chiefs. Often the father of the brotherhood and the elder-man of the clan is the same person. When this is the case, authority is doubly established. Ultimately this union effects a reorganization of the tribe itself, and clans become gentes. How this is accomplished we must now explain.

Clans are the bodies corporate for all industrial purposes. Much of the hunting is clan hunting without firearms; the wild animals have to be entrapped or captured by many devices in which all the members of the clan take part. These clan hunts are important occasions, when distant woods, distant valleys, or distant mountains become the theater of operations. Under these circumstances it sometimes happens that the male members of the clan desire to have their wives with them, but their wives belong to other clans and have their households with other clans, hence on such hunting excursions the clan organization is to a greater or less extent interrupted and the women fall under the control of their husbands instead of their brothers and mothers' brothers. This is but a temporary arrangement; but it often occurs where the clans resort to some favorite stream or seaside resort to gather and dry fish. By and by agriculture is developed. The cultivation of the soil seems usually to have been first developed in the arid lands. Everywhere in America where a primitive tribe has engaged in irrigation for agricultural purposes we find a tribal village as a central winter homestead, with a number of outlying villages or rancherias, which are occupied by the several clans during the season of irrigation. To understand the nature of primitive agricultural industry in America it becomes necessary to take these facts into consideration. In every great ruin group in America situated in the arid lands where agriculture was practiced, and also in such humid lands as were cultivated, a central ruin of the habitations of the tribe is found with outlying ruins or rancherias. When people have thus reached the state of agriculture where irrigation is practiced there is still stronger reason why the clansmen should control their wives and children. Irrigation requires the management of the stream which is used to fructify the soil, and irrigation works must be constructed. The stream must be dammed and the water carried over the land by canals; this means the construction of works that have a perennial value, and attention

to the crops during the season of irrigation as well as that of planting and harvesting. One clan on one little stream is separated from the other clans, who also have their streams during the entire season of growing crops, and the clan is thus segregated in a little summer village of its own, and in a distinct village from that occupied by the tribe during the remainder of the year.

Again, as animals are domesticated and flocks and herds are acquired, wives and children become still more essential to the prosperity of the men, for the women and children must take part in the care of the flocks. By all of these agencies the control of women and children is taken from elder brothers and given to the husbands, and the practical accomplishment of this change results in a new theory of the family—the children are no longer considered the children of the bearing mother, but of the generating father; that is, the children belong to the father, not to the mother, for in tribal society there seems to be an inability to conceive of mutual parenthood and authority. In the clan the mother is the parent and owns the children, and the father is but temporarily the guest of the wife and children.

But when the elder-man has the authority of the shaman, he easily usurps the authority of the elder-man of his wife's clan, especially when such authority is conducive to his industrial interests; for the same reason that impels the elder-man to this acquisition of authority impels the elder-man of his wife's clan to a corresponding assumption of authority, so the interest of the one is the interest of the other. There may be many clans in the tribe, and all the elder-men are interested in the like acquisition of authority and are alike willing to give and take. When this transfer is made into what we now call the gens, and the elder-man or chief of the gens has authority over his wife and children, this authority waxes very great, for he has a double power—that of the elder-man and that of the shaman, and we have the same state of affairs among the barbaric tribes of America that is exhibited to us in the historic account of the

tribes of the Greek and Roman peoples, and in fact of all of the Indo-European peoples. Under these conditions kinship is reckoned in the male line and the clan is transformed into the gens. The ruler of the gens is the patriarch who has a right to control by reason of superior age; for the law that the elder rules is still supreme, but the elder rules with a rigor unknown in savage society.

The phratry does not become the gens, though it is efficient in transforming the clan into the gens, and the phratry or brotherhood becomes a fifth unit in the hierarchy of incorporations which constitute a barbaric society. The family remains as a more or less distinct unit of organization composed of the father, mother, and children, or it may hold together as a group ruled by the grandfather. The gens still remains as a group controlled by the patriarch or chief who is in fact or by legal fiction the chief or ruler; but there is a tendency in the gens to break up into a number of households, each one ruled by a real or conventional elder-man. Then comes the phratry, which is a group of gentes. To this group are relegated many functions.

We must now understand something more about the religion of gentile tribes. In this stage private and public religion are pretty clearly differentiated. The elder-man of the gens officiates as the priest in the domestic worship, but the public worship is conducted in the council chamber, or, as it is usually called in America, the kiva, which is the place of meeting of a brotherhood or phratry, and the ceremonial worship of the people is conducted in this place. Among the Greeks the kiva was called the prytaneum. Various names are used among the barbaric tribes of America, and various names were used among the barbaric tribes of the Orient. In the upper stages of savagery there is developed a calendar system by which the kiva ceremonies are regulated. The various codices which have been discovered in Central, North, and South America are all of them calendars designed to regulate the ceremonies of the kiva. The kiva

worship is controlled by the phratral unit, that is, by the brotherhood. This place of worship is also the place where the council of the brotherhood is held. Sometimes the council of the tribe is held now at one, now at another, of the kivas. The kiva is the general place for divination where the signs are consulted for the purpose of determining whether enterprises will be successful or not. All of the operations of the people and all of the things in which they are most deeply interested are controlled by these ceremonies held in the kiva. Especially is the weather controlled, for it is here where they pray for rain, or pray for the abatement of storm. It is where the ceremonies are performed which determine the nature of the crops. It is here where health or sickness is found. When the individual is once under the power of a disease the shaman may go to his relief and gather about his sick-bed the members of the phratry who sing, dance, and perform other ceremonies for his recovery. It is in the kiva where trials for witchcraft are held.

In all barbaric societies and in many savage societies there is a place for the tribe to assemble. When architecture is developed this is called the temple, but very often it is a mere plaza under the shelter of trees, where special seats are furnished for the brotherhoods. Here men are promoted or invested with horns, feathers, or stripes,—the investiture is always a time of merrymaking, with a feast and with dancing; and here men are deposed.

Tribal life is chiefly public life. There is little domestic seclusion; often the house is a communal house for the entire clan or gens. Nearly all hunting is public hunting, nearly all fishing is public fishing, nearly all gathering of seeds is public gathering of seeds, nearly all gathering of roots is public gathering of roots; all agriculture is public agriculture, and all herds are public herds. The kiva is the gathering place of the brotherhoods, and here they meet not only for religious ceremony but to pass the time in conversation or in jest. Here the shamanistic

orator entertains the people, and here the men do their weaving and the women their basket work. The kiva is the general place of rendezvous.

In barbarism, where all the units of regimentation are fully developed, there are families, gentes, tribes, and confederacies, and for every unit there is a system of worship, and the high priest of the unit is the elder-man or chief of the unit; worship is thus specialized. The hearth of the family is the altar of the family. The place of worship of the gens is the kiva or prytaneum. The kiva of the chief of the tribe is usually the kiva of the tribe. But sometimes the tribe has a special kiva independent of that of the gentes and we call it the temple; the chief of the confederacy is also the chief of the leading tribe, and the kiva of the confederacy may thus become the kiva of the tribe, but usually confederacies only have temples. Thus three places of worship may always be recognized in barbaric society. On the hearth-stone worship is performed by oblations and other ceremonies, and sometimes with paraphernalia; in the kiva worship is performed with much ceremony and with very elaborate paraphernalia, while in the temple worship is performed especially for militant purposes and is elaborate and ceremonious. I know not why four or five places of worship should not be developed in tribal society; but I have never discovered more than three, though I always discover the five kinds of worship.

When the fathers of the phratries become the elder-men or chiefs of the other units in the hierarchy of governmental units, barbaric society is fully organized and savage society is fully overthrown. When we come to apply the criteria which we have set forth to particular tribal bodies, a difficulty arises in segregating savage bodies from barbaric bodies, for in many instances in America we find some of the characteristics of savagery and others of barbarism. Gradually a custom has grown up among the students of these societies to relegate a tribe to savagery which has the characteristics of savagery predominant, and to

relegate a tribe to barbarism which has the characteristics of barbarism predominant; but in so doing we make clan organization by kinship in the female line the deciding mark of savagery, and gentile organization by kinship in the male line the deciding mark of barbarism.

MONARCHY

The cradle of civilization was rocked by the waves of the Mediterranean. Of the origin of one of the monarchies here established we have much history. In the Greek and Latin languages there is found a literature in which is recorded the development of the Hellenic and Latin tribes into a monarchy far beyond the shores of the Mediterranean, through Europe on the north and large portions of Asia and Africa on the south. Of the nature of the monarchies absorbed by Rome and of the nature of the tribes absorbed in northern Europe, we have comparatively little data, but of the Hellenic and Latin tribes we have much history. By adding to this history the comparatively little-known history of the tribes that were amalgamated in the monarchies on the south, and the still less-known history of the tribes on the north that came under the dominion of Rome, and by interpreting this tribal history from the standpoint which modern civilization has gained by the study of savage and barbaric peoples, we are able to reconstruct an outline of the history of the origin of the Roman empire.

As the Roman empire was founded on the inchoate monarchies into which the Hellenic and Latin tribes were developed, the literature of this transmutation is recorded in these languages. The modern European nations are in some sense the offspring of the Roman empire, and a family of these nations was developed.

After the fall of the Roman empire a period of centuries elapsed which are often called the Dark Ages. History which we may not stop to recount led to what is usually denominated the Revival of Learning. Then the younger nations sought in the

literature of Greece and Rome for the history of their origin, and they found in these languages the records of a high state of culture, especially in architecture, sculpture, poetry, and metaphysics. Thus the Greek and Latin languages were the repository of "the wisdom of the ancients" on these subjects. To trace the evolution of European religion it is necessary for us to go to its source in the Hebrew; but to discover the origin of the governmental institutions we must go first to the Greek to discover the nature of the barbaric tribe, and then to the Roman to discover the nature of the monarchy, and from the two sources we may learn the development of tribal society into monarchical society. We must now characterize in a few sentences the agencies by which barbaric society is transformed into monarchical society.

We first note that the more highly cultured tribes are domiciled in walled cities. Every such city is a center of culture superior to that exhibited by tribes not yet domiciled in walled cities.

In savagery the custom of causing the captive to "run the gantlet" was early observed by civilized men, but the significance of the custom was not understood, for it was supposed to be only a method of torture. Prisoners who have long remained in the custody of their captors tell us of the significance of the custom. Modern scientific investigation clearly reveals its nature. There seems to be a desire among savage people to increase their numbers by incorporating captives into the body politic. Such captives are often selected to take the place of persons killed or captured by the enemy. Sometimes the captive is required to exhibit his courage and skill by causing him to "run the gantlet," and if he emerges from the ordeal with honor some woman adopts him as her son. When thus taken into the clan his birth dates from his adoption. He is, therefore, younger to all the members of the clan who at that time are living, but he is elder to those subsequently born. The captive may be promoted from time to time as other members of the clan if he wins such promotions by good conduct. He may thus become the elder-man of the clan or

even the chief of a tribe or confederacy. There are circumstances under which the captive is refused promotion—as for example captives taken from hereditary enemies who are believed to be sorcerers, or who are popularly believed to be cannibals, that is, to eat human bodies for food instead of in a ceremony of magic which is the universal practice. The captive is thus doomed to perpetual *youngership*, if the term may be permitted; that is, to perpetual servitude, because all other members of the tribe may consider him as last born and never to be advanced in age. In savagery there seems to be but little evidence of this state; but when in barbarism agricultural and zoöcultural industries are organized, and other industries are carried on for exchange, then the labor of captives becomes an important factor in the industrial life of the people, so that captives are taken, not simply to reduce the numerical power of enemies and to increase the numerical power of the captors, but they are also taken as laborers; then labor slavery is first developed. Before this stage family slavery only exists. In the brief account which we are giving, what seems to be a radical change must always be considered not as an instantaneous change but a change which requires centuries of history with its vicissitudes of many different examples, occurring at different times, which furnish instances of evolution only in part representing the final change, but changes on changes in the treatment of captives resulting at last in changing family slavery into labor slavery. We will hereafter see how labor slavery is changed into chattel slavery.

Walled cities become cities of wealth because they are centers of esthetic and industrial art. The aggregation of wealth in these cities makes them rich prizes and stimulates war, so that wars are instigated not only by current disagreements, as in savagery and barbarism, but by greed for wealth which consists in the stores accumulated in cities and in the labor of the inhabitants when captured. Vengeance is a powerful motive for war, but greed has greater might.

When men are gathered into cities, the land which they cultivate extends far outside their walls, and the animals which they domesticate are pastured on distant hills. In the stage which we are now discussing, slaves are employed as artisans in the city, and they are also employed as agricultural laborers and herdsmen in the country. Their employment in this manner requires surveillance lest they escape. To prevent their escape and to relieve the constant watchfulness of their masters, it becomes necessary to give them many inducements to remain and labor; this is accomplished by giving them an interest in the soil and an interest in the flocks and herds, and by promoting their domestic life. Thus slaves become clients. Sometimes whole tribes are conquered and employed as clients to cultivate their own lands. Thus captives become serfs attached to the soil, and the title to the serfs passes with the title to the soil.

Still the conquering city may reduce other tribes to vassalage and require of them annual tribute, but permit them to continue in the pursuit of happiness and welfare by their ancient methods subject only to the collection of tribute. Sometimes the tribute may be in men, and is furnished to the armies of the conqueror.

It is thus in monarchy that various forms of servitude are found, as family servants, as clients, as serfs, as vassals, and chattel slavery itself is common.

In tribal society the integration of bodies politic is mainly by treaty agreement for offensive and defensive purposes, for this seems to be the method of organizing confederacies; but in monarchical society much integration is accomplished through conquest by which foreign peoples are reduced to subordinate positions impelled by ambition. They may be made slaves by the greed for gold, but they may be made subjects by the ambition to rule. Such subject provinces must pay tribute, and usually the tribute-bearing people must be subject to rulers who are themselves subject to the central government, as members of the

central aristocratic class. Thus monarchies are integrated through slavery and provincial government.

There is yet another element of the transmutation which we must set forth. This is the consolidation of religious power in the chief of the central city, who is not only a king but high priest of all the units of the monarchy. In the central city resides the central authority. The central tribe, in which are not included domestic servants, constitutes a distinct body politic with all its hierarchy of units, with its chief ruler who is also high priest, and subordinate rulers who are also subordinate priests. The subject provinces are governed by rulers who emanate from the central city. The people of the central city thus constitute an aristocracy to govern the subject provinces. When things are brought to this pass the pure monarchy is developed. It will be seen that the fully fledged monarchy is a stage of society of long growth, but the steps in its growth are very irregular and often turn back before monarchical society is instituted.

We have said that the emperor is the high priest of the people. Finally the high priest is fired with the ambition to become the high priest of all religions. Then comes the time of persecution for non-conformists, and then comes that motive for war which is most potent—the doctrine that false religions may be eradicated by force. Then come the profound belief in the thaumaturgic doings of the god of aristocracy as miracles, and its concomitant belief that the doings of false gods are sorcery.

Such are the agencies by which tribal society with kinship regimentation is developed into national society with district regimentation, where the land of the aristocracy is the home of central government, and the provinces subordinate units of the nation. In savage society the most important unit of organization is its body of kindred who reckon membership in the female line. In barbarism the most important unit of regimentation is the body of kindred who reckon membership in the male line, and the patriarch becomes the high priest. In the

monarchy the people are regimented by lands. The capital of the country of the aristocracy is the seat of government, the provinces are minor units of government, and the monarch is the vice-regent of the god.

In monarchy a method of government and a consequent stage of society in hereditary ranks obtain. As the units of government constitute a hierarchy of control both in civil and religious conduct, so also there is a hierarchical aristocracy. Position in this aristocracy is determined by hereditary descent. Every person is born into a status of rank in society.

The kingship is inherent in a family and descends from father to son. In the failure of lineal descent the kingship passes into a collateral line. Thus a dynasty is produced which continues from father to son, or to nephew, or occasionally to daughter or niece, until such dynasty is overthrown.

Other members of the aristocracy are nobles of various ranks; but nobility passes from father to son, the eldest living son taking precedence, and the title may pass beyond lineal descendants into collateral lines. The monarch may create new orders of nobility at will; and he may create nobles from the common ranks, and may also promote from rank to rank. It is thus that position among the nobles is in the gift of the crown as a reward for service. A shrewd monarch uses his power not only to reward men for service, but also to keep up a body of persons of superior capacity to coöperate with him in sustaining the royal authority and dignity.

In this manner a governing body is constituted in a hierarchy of ranks, social, governmental, and religious, with the power which inheres in wealth, the power which inheres in government, the power which inheres in the command of the armies, and the power which inheres in ecclesiastical domination and dignity.

This comparatively small group of persons rule over the people, who are also arranged in a more or less clearly defined hierarchy of ranks, as freemen, serfs, and slaves. The freemen

constitute a middle class, as merchants, artisans, farmers, and soldiers. In this class also there is a tendency to differentiate the people by their occupation into hereditary groups as guilds, so that the man inherits the occupation of his father. An extreme development of guilds results in the development of caste. In caste, intermarriage between groups is forbidden; the higher castes become sacred, while the lower castes are held by the higher castes as unclean, and not only is intermarriage prohibited, but many other social functions cannot be carried on in common.

The failure of lineal descendants in the monarchy leads to disputes over the succession, and dynasties are often changed. The same fact appears in the successions which occur in the ranks of the nobles. Sometimes these successions become a matter of interest to the crown, so that the monarch often takes part in determining successions, thus rewarding his friends and punishing his enemies. Throughout the stage of monarchy great armies are organized, and sometimes successful commanders arise, and such commanders are rapidly promoted into the ranks of the aristocracy. Sometimes successful warriors become ambitious even for supreme rule, and may overthrow the reigning dynasty to usurp its wealth, honor, and power. Thus hostile dynasties are produced.

We have now presented a meager and perhaps inadequate account of that stage of society which we call monarchy; but the hope is entertained that the characterization has been sufficient to make plain how kinship society is transmuted into territorial society, while yet the principle of kinship with authority and privileges with the elder remains only in the governing groups as an aristocratic body.

REPUBLICKISM

Tribal governments are almost pure democracies, if we understand by that term that leadership and measures of government

are submitted to the voice of all the people for decision. The ideal of tribal government which is forever held in view, though it may be obscured, is that of a pure democracy founded on the will of all the people directly expressed by them as individuals.

When national government is established on a territorial basis, democracy is overthrown and kingship with aristocracy takes its place, and monarchical society is organized. Monarchical society, in turn, gives place to a fourth stage, which we here call republickism. We use the term in no partisan sense and select a new form of the word in order to avoid partisan implications. The term republicanism, as used by statesmen, of whatever party they may be, usually signifies a method of representative government. It is in this sense that we use the term republickism, and we leave the term democracy and also the term republicanism to be used with partisan meanings.

As the fifteenth century drew to a close, Columbus, the great navigator and discoverer, became the promoter of an enterprise to sail westward from Europe in quest of a better route to the Indies, a land of fabulous wealth. For centuries scientific men had believed in the spherical form of the earth, but the great body of the people did not accept the doctrine. After many unsuccessful attempts Columbus at last sailed westward with a fleet bought at the price of the good Queen's jewels. Instead of discovering a route to the Indies, he discovered a new world. Perchance others had previously discovered land at the north, but they knew it not as a new world, nor did they know it as a gateway to the land of fabulous wealth, nor were they impelled to the discovery by the acceptance of a doctrine of science. The merit of Columbus was his faith in science, and as a reward for his faith history crowns him as the Great Discoverer. The new world was the trophy of science.

The new world became the theater of new enterprise. The discovery gave to science the hope that it might prevail against superstition. Perhaps the thought that science may be useful to

mankind was more potent with boon to man than the enlargement of the theater of industrial enterprise.

Be this as it may, the new world became the home of republics. The example of these republics has spread the egis of free institutions over much of western Europe, and the leaven of freedom works unrest for all monarchical governments of the world. The principles of representative government may seem to flourish best when republics are founded in due form, but they have an almost equal potency in reforming monarchical governments. Such governments may not formally adopt republicanism in terms of free institutions, but by a legal fiction they may engraft on the monarchy the substantial principles of republicanism, though nominally they are governed by an aristocracy with a kingly chief. Formal republicanism and virtual republicanism seem thus to be competing for universal dominion, though competition may in fact be coöperation.

The agencies at work to transmute monarchy into republicanism may be summarily, though imperfectly, stated in the following manner:

First, the industries of the world are undergoing transmutation. Inventions multiply with the scientific thought that was born with the discovery of Columbus. Brawn is governed by brain, and brain through brawn governs the forces of the world, and thus men are emancipated from toil. Through invention toil is raised to the dignity of industry sweetened with pleasure and rewarded with welfare.

The invention of machinery and the development of scientific processes of production have had potent effect on the reconstitution of society. Handicrafts have been revolutionized by the introduction of a high degree of intellectual skill, as manual skill is relegated to the operation of machinery to which great precision is given. When manual skill was obtained only by long practice in a restricted number of manual operations, it was held to be necessary to serve a long apprenticeship to a trade:

but as the machine performs all the nice mechanical work, the artisan turns his attention to the control of the machinery, and to be successful in its manipulation he must understand the principle of mechanism and the application of powers to the accomplishment of human purposes. The skill now required in handicraft is the skill of intelligence supplemented with universal skill in handiwork. It is thus that industry is emancipated from the system of slavery involved in apprenticeship, and a new system is rapidly developing in which childhood and youth are taught the fundamental elements of all handicrafts in the common schools. Political economists have deplored the inability of laborers to change their occupation, seeing that the introduction of machinery destroys many a special handicraft, and the laborers employed therein are compelled to seek employments without the benefits of apprenticeship. The introduction into industry of scientific methods practically makes them all accessible to all men.

Another change to be noticed is the enlargement of the sphere of commerce. Production may now be carried on in the most economic manner wherever special conditions exist favorable to production; climates may be more thoroughly utilized for the development of special products, and powers may be utilized wherever they are found under the most favorable conditions in nature. The enormous cheapening of products by their narrow specialization and by their multiplication through the efforts of the few who are the most favorably conditioned for the special production, requires that the producers of large quantities of special goods be distributed to great numbers of consumers, and thus commerce is multiplied. For the development of commerce to meet these new conditions, inventions are employed, and the highways of commerce are made to ramify throughout the country and throughout the world. All of these processes coöperate in the reconstitution of society by specializing industries and integrating them through commerce, and the

lesson is taught in everyday life that human success is best promoted by serving others.

Second, from the primeval state of society up to that state of society which we call republickism, tribes and nations were kept asunder by walls of language. An unknown tongue was a herald of enmity and a mark of folly, and aroused all the hate of superstition. When culture was buried in the classical languages, and when the accomplishment of the student was measured by his knowledge of these tongues, a great impetus was given to the acquisition of languages. Since science is promoted by all civilized nations, science itself demands a knowledge of many modern tongues. By all of these agencies it is discovered that a foreign tongue is not an unmeaning jargon and language itself is no longer a barrier between civilized people. The wheels of commerce speed civilized men from land to land and they find themselves integrated by common interests.

There is a third agency by which the transmutation of society is accomplished. The literature of all lands is read in every land. The current history of all lands is recounted in every land. The agencies of intellectual culture are not restricted by national boundaries. Higher than all, and more potent than all, is the universal brotherhood of science by which the discovery made by one man is revealed to every other man and by which the generalization made by one man enriches the thought of all.

A fourth agency for the transmutation of society is found in the fine arts. The musical artist sings for the world. The limner paints for all lands. The actor impersonates for the universal stage. The novelist portrays for every fireside. The poet chants a lay to every dreamy heart. Thus the esthetic arts make a universal appeal to the finer feelings of mankind and forever teach the lesson of fraternity, and with the balm of joy heal the wounds of conflict.

Fifth, all of these indirect agencies for the transmutation of society coöperate with the development of governmental

principles due to the increasing intelligence of civilized men. With knowledge comes a love of justice that recognizes that rights may best be secured by the performance of duties. Forever and forever is this lesson taught by advancing culture. In the strife to establish justice through the agency of government men learn to delegate their power to representative men chosen for their wisdom.

The first presentation of the true nature of representative government is recorded in the literature of Greece. In Plato's *Republic* we find romance dealing with ideal government. The old philosopher dreamed of a state of society in which the conduct of government should be relegated to the wisest and best of mankind. Further, he attempted to set forth the conditions under which the wise men should rule by delineating their marriage relations and their property rights in terms that seem strange and even bizarre to modern thought. Alas, he did not properly comprehend the method by which the wise men could be selected. His theory of government by the wise and good became the ecclesiastical polity of the two great churches of early civilization, the Roman church and the Greek church, which were organized to secure the rule of the wise and good, and by both civil affairs were made subordinate to ecclesiastical affairs.

While Plato thus became potent in founding the policies of these churches, Aristotle was more influential in founding their philosophies. The role which these two great thinkers played in the history of early civilization was profound, for they cast the thought of centuries into molds of learning, and these molds gave figure and structure to philosophy and to church polity which has lasted until modern times, when the molds were broken only by the blows of science.

We have stated that to Plato we owe the earliest comprehension of the principles of representative government. These principles we must now set forth.

It is an inherent principle in society that the many follow

where the few lead. Knowledge is always born of one and diffuses to the many. The annals of science is the record of the discovery of individuals. Advances are made by discoverers and the world of science is dependent upon intellectual leaders. A new thought may lie dormant until it finds clear expression. It often happens that new thoughts gain acceptance only when they are presented by some person who has the genius of expression, but when they come to be deftly expressed they are speedily diffused among mankind.

We discover in nature that all knowledge has its purpose, and that this purpose is its utilization in affairs of life. All knowledge must be utilized in this manner before it has its final expression which all men may understand. Universal diffusion of knowledge can come only by its utilization in the affairs of life which interest all mankind. This utilization depends first upon the inventor and second upon the undertaker—the *entrepreneur*. It is thus that knowledge must have a triune leadership in the discoverer, the inventor, and the undertaker, and they must co-operate for the increase and diffusion of knowledge among men, and then only does knowledge receive its final expression which all men may understand. It is within the province of every government to promote economic policies, and this it must do, either for weal or for woe. The leaders of the people must be protected and encouraged—protected from injustice and encouraged by due reward. As their operations have a profound effect upon the progress and welfare of mankind, this effect must be promoted by the establishment of justice to all. The four fundamental laws of economics for which governments are responsible are these: (1) Reward must be secured to the leaders; (2) protection must be given to leaders; (3) justice must be secured to their followers; and (4) welfare must be secured for all.

The four maxims of good government require for their operation some method of securing wise and good men to carry on the

government in all its departments. We have already seen that ancient society selected its leader by the methods of the pure democracy. There came a time when these methods broke down because of the great numbers of persons embraced in the body politic. Then the world tried a new plan of government by creating an hereditary aristocracy with hereditary kingship. This system also has failed. Now the effort to secure good government as representative government is undergoing trial. The theory of this method of government is fundamentally representative by election, but perhaps the principles of representation are inadequately understood.

Let us try to formulate these principles. Fundamental or primary representation should not extend beyond the boundaries of the primary units of government. These are townships or wards, and the governing officers of these units should be elected by the citizens of the several units. In the secondary units, or counties, electors should be chosen by every township or ward composing the county, and they should select county rulers or city rulers where counties and cities are coterminous. In the third unit, which is represented by the state in this country, the county electors should choose the state ruler. In the fourth or grand unit, which is the nation, the county electors should choose national electors, and the national electors should choose the officers of the general government. This, it is believed, would perfect representative government.

The rights and duties or the theater of operations of the several units of government should be defined; that is, township rights, county rights, state rights, and national rights should be jealously guarded and strictly observed.

History has already demonstrated that the government cannot safely be intrusted to an ecclesiastical body. History has already demonstrated that the government cannot be intrusted to an hereditary body. History has already demonstrated that the government cannot be intrusted to a purely democratic body.

The advanced nations of the earth are now making the experiment of intrusting government to a representative body, and it would be wisdom to consider how a representative body may be best chosen.

The history of mankind has been the constant theme of the ages, because it has been the subject in which men are most deeply interested. Especially has the rise and fall of nations, the rise and fall of dynasties, and the part which individuals have played in such affairs been the theme most attractive. Notwithstanding this fact, the outlines of history as they have heretofore been presented have consisted largely of a more or less bare statement of events in chronological order. Universal history has therefore been treated as annals. Special writers have attempted to treat of the different parts of history as the succession of causations, but universal history has rather been a compendium of names and dates. Since the establishment of some of the laws of evolution and the overthrow of the ancient doctrine of degeneracy, a new impetus has been given to history, and now a multitude of men are engaged in scientific research having in view the discovery of the progress of mankind by revealing the causations involved. For this purpose the world is ransacked for the vestiges of human culture in all of the pentologic departments of the humanities. Historics as a science is thus disclosing a vast body of facts relating to the evolution of pleasures, industries, institutions, languages, and opinions. Hitherto we have considered only the nature of institutions in attempting to set forth the four fundamental stages to be observed in their consideration.

The course of history in the evolution of institutions is the best nucleus about which to gather the data of progress in the other departments of history. The sketch we are attempting will not permit of any exhaustive treatment. We must content ourselves with only a brief reference to the evolution of pleasures, industries, languages, and opinions.

The Four Stages of Esthetic Culture

These stages are well represented in the fine arts, which are music, graphics, drama, romance, and poetry. The course of this evolution we have already set forth to the extent necessary to this argument.

We have shown that the stages of development in music are rhythm, melody, harmony, and symphony. In graphic art they are outlining, relief, perspective, and chiaroscuro. In drama they are dance, sacrifice, ceremony, and histrionic art. In romance they are beast fable, power myth, necromancy, and novels. In poetry they are personification, similitude, allegory, and trope.

The Four Stages of Industrial Culture

The four stages of industrial culture we have shown to be the hunter stage, the agricultural stage, the artisan stage, and the machinery stage, by setting forth the transmutations which these agencies have produced in society.

In like manner we shall briefly revert to four stages of culture in languages, and also in opinions, and shall attempt to correlate them with savagery, barbarism, monarchy, and republicanism. It hardly seems necessary to call attention to the concomitancy of the five fundamental elements of culture, but simply to affirm that they are connate and that there can be no pleasure without welfare, and no welfare without justice, and no justice without expression, and no expression without opinion.

ETHICS

There is a fallacy in the reasoning of primeval man which has produced what has come to be known as the ghost theory. The notion of consciousness as a reified property independent of the body is the first-born of those fallacies which constitute the foundation of metaphysic. But primeval man did not discriminate consciousness from cognition; so that the fallacy was rather the

notion that organized consciousness or mind has existence independent of the body. So mind is reified and given a subtle tenuous body that can enter or depart from the material body.

To understand the origin of this notion we must first discriminate between inference and cognition, and then realize that cognition is verified inference and that there is no cognition without verification. Then we must understand that inference is the selection of a concept from memory with which to compare a sense impression. The consciousness of the sense impression and the consciousness of the concept are both attributes of self. Hence inference is the comparing of a psychic effect on self with a psychic memory of an effect on self, to discover whether this cause is like that cause. It thus happens that the self is taken as the standard of comparison in every inference. The objective world is thus gauged by the subjective world. This doctrine in which man is taken as the measure of the universe is known in science as anthropomorphism. In the individual it is the interpreting of the objective world by concepts of self, and as men communicate concepts to one another in the race it is the interpreting of the non-human universe in terms of the consciousness of man.

If we understand the nature of inference and its dependence on verification to become valid cognition, we are prepared to understand the origin of the ghost theory by unverified anthropomorphic inferences which produce fallacies that are only notions.

The fallacies at the foundation of the ghost theory are the fallacies of dreams. The notions of dreams are thus responsible for the primitive doctrine of a ghost as a reified property. In dreams we traverse the regions of space and witness strange scenes and take part in wonderful deeds and have astounding emotions.

That the notions of dream history are reinforced by the psychic phenomena of ecstasy, hypnotism, intoxication, and

insanity, we have set forth elsewhere. That such dream notions seem to be verified by certain phenomena of nature we have also shown, and need only to allude to shadows, reflected images, and echoes. Altogether this fallacy is deeply implanted in the savage mind; it continues as a notion even in the minds of some of the most intellectual men of modern culture. In savagery the notion is that all bodies animate and inanimate alike have ghosts; the theory is then called animism. The relic of this theory in modern culture is the belief that all animals have ghosts, or, still further specialized, that only human beings have ghosts.

The ghost theory has played an important role in the development of ethics which we will try to unfold.

In savagery, life and mind are attributes of ghosts. Material bodies are supposed to be inert, while to the ghostly bodies is attributed all action. Rocks, waters, plants, and stars, as well as animals, have ghosts. It is to ghosts that all purposes are attributed, and all powers to accomplish purposes inhere in the ghosts of material bodies. All of the good and evil which befall them are thus attributed to ghostly beings.

Dancing, music, and feasting are the superlative joys of savagery, and the joy is an attribute of ghosts. Pain also is the attribute of ghosts. Ghosts seek pleasure and avoid pain. It is universal in the primitive stage of society to seek for good and to avoid evil through the agency of ghosts. This motive leads to the organization of shamanistic customs which constitute the religion of the people to secure superlative good and to avoid superlative evil. The motive of primitive religion is the longing for superlative happiness, and it remains as the motive of religion in all stages of culture. Religion is thus a theory or doctrine of securing happiness. The happiness desired may be in the immediate future or the remote future; it may be for time or it may be for eternity, or it may be for both time and eternity. If we are to understand the nature of religion we must always conceive it to be a system of securing superlative happiness. The

motive of religion is the gain of happiness, and the methods of religion are the methods of obtaining happiness.

We are now to explain what methods of securing superlative happiness are devised in savagery.

Esthetic joys are the primary pleasures. Such joys are founded on the pleasures of physical activity; not the activity of labor itself, but on social activity. The dance is the primeval ceremony of religion; connate with it is the joy of feasting, so that both feasting and dancing constitute connate religious ceremonies that are universal in savage society. The festival is a religious ceremony of savagery. Preparation for the highest enjoyment of the festival is often found in the practice of fasting, so fasting becomes antecedent to festival. The pleasures of love naturally arise through the social pleasures of the festival and are often added. Therefore superlative happiness consists in the revelry of the festival.

Days come and wants are renewed. Plenty brings joy, but hunger brings pain. The memory of want is the mother of fear. The experience of hunger is the primitive motive to industry, but industry has precarious rewards in savagery. The hunt may be in vain. The tree may not yield its fruits. The savage seems forever to be the victim of chance. The seasons come with heat and cold, with sunshine and with storm, and these vicissitudes press upon the savage a load of care and thought, for good and evil are dependent on the changes of nature. Over this nature he seeks to gain control. Primitive man knows of control only as control of motive. The ghosts of the world must be controlled in the interest of the people of the tribe. Ere he has learned to plant he attempts to allure, and before he attempts to control he attempts to propitiate. He would secure happiness from the ghosts of the world by tempting them with the superlative joys with which he is himself conscious. So he attempts to influence ghosts with festivals, and to hold audience with the ghosts by charming them with the highest pleasures with which

he has knowledge. Not only is the festival an assemblage of people, but it is also an assemblage of disembodied ghosts who take pleasure with them.

The steps of the dance are controlled with the rhythm of music. Thus music and dancing become associated. Ghosts also love music. Music and dancing attract the ghosts to the festival and inspire in their tenuous hearts the highest gratitude. But how can ghosts best exhibit this gratitude to men? To accomplish this the forest dwellers devise methods of talking to ghosts, expressing their wants, revealing their intentions, and alluring to beneficent deeds. So ways are devised for communication with ghosts by gesture speech and illustration. In savagery a religious ceremony is a text of prayer with illustrations—prayer in gesture speech and illustration in altar symbols.

In every savage tribe a place of worship is provided, which is also a place for the assemblage of the people in council, in social converse, and in amusement. Then an altar is provided. An altar is a space upon the floor or a table on which the paraphernalia of worship are exhibited. They consist of various things designed to symbolize the objects of prayer. Perchance they pray for food; then corn, acorns, portions of animal food or parts of animals that are held to represent them are placed on the altar. With tribes that collect grasshoppers for food, grasshoppers are used and grasshopper cakes are displayed. With tribes that cultivated the maize, ears of corn become the emblems of desire, and ears of many different colors are selected to typify abundance. Then jewels of quartz and garnet and turkis and other precious stones are displayed to signify that the prayer is for well-matured grain, hard like the altar jewels. In arid lands they pray for showers and paint symbols of clouds upon altar tablets and provide flagons or ewers of water which they sprinkle in mimic showers with wands made of the feathers of birds. Birds are also associated in their minds with the planting time and with the harvest time, and they make images of birds, carving

them of wood and painting them with brilliant colors, or they make their bodies of fragments of cloth and decorate them with feathers. The birds are then placed upon perches and the perches placed upon the altar. Many are the devices to represent animal food.

The similitudes and associations which are suggested to the savage mind are utilized in this manner in many a quaint way. The "correspondences" which the sylvan mind discovers and invents to utilize in prayer speech would delight the heart of the mystic.

Having provided an altar with its holy objects, the devout shaman pours forth his praises to the ghostly divinities and invokes their aid in controlling the sunshine and the storm, chanting in established forms of speech and prescribed reiterations. As the prayer proceeds, at definite moments the appropriate symbols are displayed and symbolic actions are performed, all designed to illustrate the prayer.

Such are the prayers of the sylvan man, designed to secure superlative happiness. The ceremonies are performed periodically at appropriate seasons, and that they may not be neglected calendric systems are devised. These are painted on tablets of wood, on the tanned skins of animals, or on the walls of the house of worship, the calendars designating in some symbolic manner the time of the year when certain ceremonies are to be performed, the appropriate ceremonies for the time, the deities to whom the ceremonies are performed, and the characteristics of the ceremonies themselves.

As primitive music has a religious motive, so primordial carving and painting have a religious motive. In like manner the first dramatic performances are religious, all designed to propitiate ghost deities and to secure their favors. When this stage of esthetic art as religion is fully developed, men have passed from savagery to barbarism. To rhythm melody is added in music, to outline drawing relief is added in graphics, and to dancing

acting is added in the drama. Then terpsichorean religion is developed into sacrificial religion, for in barbarism the altar symbolism is further developed so that food and drink are sacrificed to the gods. In this stage the ghost deities are believed to enjoy for themselves not only the dancing but the feasting which is offered them.

All of the fine arts have their origin in religion, for in the worship of ghost deities tribal men seek to propitiate them and win their favors. In this effort they exhaust all their ingenuity in the production of music, graphic, drama, romance, and poetry. Tribal music is thus the worship of the gods; tribal graphic, in the same manner, is illustration to the gods; tribal drama is gesture speech to the gods; tribal romance is story about the gods, and tribal poetry is song of the gods; finally, tribal religion is first dancing to the gods, to which is added the feasting of the gods, and at the close of this state of society religion is terpsichorean and sacrificial in its essential characteristics. The practice of religion is no inconsiderable portion of tribal life, and it occupies a large share of tribal thought.

Here we must pause to emphasize the thought that religion has for its purpose the regulation of conduct in such manner as to secure, through the agency of the gods, superlative or perfect happiness. Thus is the conduct of men regulated by motives that although they are artificial they are yet profoundly potential, for the conduct which is thus instigated is held to be the wisest and best for mankind. It is the ethics of tribal men. Ethics is, therefore, a theory of superlative or perfect conduct. If we consider it as conduct, it is ethics; if we consider it as reward, it is religion. Ethics and religion are identical, the one is the reciprocal of the other.

Through the stage of monarchy the king usurps the function of high priest. His courtiers flatter him as the vice-regent of deity, and he strives to be considered in this light. Often self-deceived by adulation he has a profound faith in the sacred

character of his person and authority, notwithstanding which religion undergoes further development. The pageantry of kingly courts is the pageantry of religious ceremony. The festivals which are promoted by rulers all have a religious character, and the priesthood constitute a body of men which are often learned, often devout, often zealous, and often profoundly interested in the good of mankind. Ecclesiastics thus constitute a specialized body of men whose function it is to receive the new-born and consecrate them to the higher life of religion. It is their duty to train the youth in the nurture and admonition of religion. It is their duty to admonish and reprove for evil conduct. It is their duty to guide men in all the ways of life. When the most important event of social life occurs, they solemnize the marriage and they seek and often exercise the power of controlling marriage relations in the interest of religion; in sickness and in pain they shower comfort and fortitude, and they bear in their hands as offerings for religious conduct the bounties of paradise. When the portal of death is open, kindred and friends are consoled, and the occasion serves to enforce the doctrines of religion. Thus religion, which is a theory of superlative conduct, employs sanctions of superlative potency.

The association of the fine arts continues through the stage of monarchy. Largely their evolution is accomplished through the agency of the priesthood, and men of genius who are devout worshipers contribute their share to the advancement of esthetics often impelled by religious ecstasy. In music melody and harmony are added by ecclesiastics as an adjunct to temple worship. In graphic, to sculpture and relief perspective is added, impelled by the motive of decoration to the walls of the temple. In drama the mysteries of religion still constitute the theme, while to dancing and sacrifice ceremony is added. The drama is no longer the leading element in religious worship, but it becomes an accessory element designed to instruct the people in the mysteries of religion. In romance, to beast fables and power myths

tales of necromancy are added. In poetry, to personification and similitude allegory is added, and the themes of poetry are mainly the themes of religion.

Religion itself undergoes marked development. There still remains an element of terpsichorean worship and an element of sacrificial worship, but ceremonial worship is more highly developed, while terpsichorean and sacrificial worship is performed with an allegorical meaning.

Here we must note, as of profound significance, that the fine arts or arts of pleasure are all pursued in the interest of religion. Music, like all the other fine arts, may be made by individuals for personal pleasure, but, in tribal and monarchical society, the motive which secures excellence is demotic. This demotic excellence inheres in religious ceremonies. In these stages of society the evolution of the fine arts is therefore wholly dependent upon religion. It is thus that religion is practiced in intimate association with the pleasures of mankind from which it receives the glamour of superlative joy.

Ethics and religion are still identical, for religion as a theory of conduct is still the highest ethics of mankind.

We have yet to portray the evolution of ethics during the social state of republicanism. On the threshold of this phase of the subject we must consider the role which is played by great leaders in society. This we have already set forth in other departments of sociology, but in the department of ethics, moral leaders are most conspicuous, and by their disciples they are often esteemed divine, and especially do they rank as prophets. About their birth and about their personal history wonderful stories are told, and to their personal agency miracles are attributed. Among the most conspicuous of these great moral leaders, Laotse of the Chinese, Buddha of the Hindus, and Jesus of the Christians are perhaps most revered by the multitudes of mankind. Mohammed has a great body of disciples, though he departed from the course pursued by the others in attempting to propagate

his doctrines by the agency of the sword. These personages were all moral leaders who revolted against the ceremonial religion of their times, and as a substitute propounded doctrines of a higher ethical nature. He who would understand the principles of divine ethics must seek them in the teachings of Laotse, Buddha, and Jesus. Our civilization is familiar with the teachings of the tribes who taught moral perfection in the Sermon on the Mount, which has been reiterated, amplified, and illustrated by the greatest thinkers, the wisest men, and the purest characters that have lived in all the history of the Christian nations.

The disciples of these prophets have invoked the aid of the fine arts, and thus the most exalted of the esthetic pleasures have become associated with their teaching. The sweetest music has still a religious theme. The most beautiful graphic has still a religious motive, that is, an ethical motive. The most thrilling play has still an ethical purpose. The most absorbing story has still a higher moral. The most entrancing poem is still informed with the spirit of truth. Music has added symphony to its methods; painting has added chiaroscuro; drama has added histrionic representations; romance has added the delineation of consequences for moral conduct, and poetry has added trope.

Religion also has developed another stage which demands our consideration:

Moral concepts propagated by teaching and assimilated by acception are affiliated to the notions already entertained; hence great prophetic teachers are not able to diffuse their doctrines in their purity, they can only propagate them in a modified form.

Concepts are propagated by cross fertilization from which new varieties spring. To propagate fruits with their essential characteristics we must resort to cuttings; but concepts cannot be propagated as cuttings, but only by fertilization. Thus moral concepts in the process of diffusion are modified. It is impossible in society to start a new stock of concepts. Moral

opinions cannot abruptly be revolutionized; they can only be developed. The past cannot be ignored by the present; the present is ever modifying the past. Healthy change must be evolution, not revolution, though there is an element of revolution in all evolution. Something must be overthrown that evolution may be accomplished. The individuals of a species must die that new species may be developed, but the new species must be the offspring of the old.

The great moral teachers and prophets have never succeeded in establishing a principle of ethics in all its purity as conceived by themselves. The notions of ceremony developed during the stage of monarchy were modified by the teachings of the prophets, so that a ceremonial religion was developed into a fiducial religion in which the ceremonies are considered as efficient agencies of teaching; but the essential nature of ethical conduct is held to inhere in the opinions which men entertain. Ethics is a faith, and hence we call this stage of ethics fiducial. Men must entertain the opinions believed to be wise that they may gain that superlative happiness which is the reward of conduct.

But how shall men know the good from the evil conduct? By what criterion shall men be guided in the affairs of life? Here a threefold standard is erected. The first is the teaching of the ancients, the second is the teaching of the priesthood, the third is the voice of conscience. These three authorities are supposed to coincide in producing valid concepts of good and evil.

Conscience is the instinctive impulse to moral conduct. To understand this statement we must explain the origin of instincts. Instinct is to the emotions what intuition is to the intellections. Intuitions are habitual judgments of intellect, as instincts are habitual judgments of emotion. As intuitions become hereditary, so instincts become hereditary. The substrate of instinct is the choice exhibited in affinity. In the human mind the

affinity of the several particles is organized as an apparatus of choice with a nervous system of ganglia, nervous fibers, and muscular apparatus which consists of a hierarchy of instruments of activity, otherwise called self-activity.

The habitual exercise of this apparatus in any particular method results in the production of habits which, on becoming hereditary, are called instincts. An instinct is inherited not as a developed habit, but as a tendency and facility to do or act in a definite manner. In common life these instincts are observed on every hand. The instinct to partake of food is inherited as an aptness and developed as a practice; so the instinct to walk is inherited as aptness and developed by practice. The instinctive fear of serpents is inherited as an aptness and developed by practice, so that children as well as adults easily acquire the fear of serpents and express this fear and repulsion by acts of fright and avoidance. The fear of fire is easily and speedily developed.

There thus exists a tendency in the human mind to moral conduct and to inhibition of immoral conduct. This tendency is called conscience. Every human being is thus endowed with conscience as an instinct or hereditary aptness to act in a moral way. There are many other habits that are instinctive, and other instincts may control the individual while the moral instinct is held in abeyance. The moral instinct, like all the other instincts, is inherited only as an aptness and must be developed by exercise. Conscience can be cultivated only by the moral sentiments which the individual entertains. The sentiments of good and evil are governed by the knowledge of truth and error; that is, the emotions are fundamentally governed by the intellect, although the emotions may in like manner govern the intellect, for intellect and emotion are coöperative in every act of life. The knowledge of good and evil follows hard upon the knowledge of truth and error. In the economy of nature the intellect is first the servant of the emotional life until by its high development it becomes the master. In the ethics or religion of man

in the scientific stage of culture the knowledge of good and evil will depend upon the knowledge of truth and error. Then conscience will be an infallible guide; thus conscience becomes the ultimate criterion. Ethical conduct is conduct sanctioned by conscience. The ideal of religion has ever been the control of conduct by that agency, although other sanctions have been employed. Conscience is the child of religion and evolves as religion evolves, and religion evolves as the intellect evolves.

Such are the characteristics of the religion or principles of ethics inherited by the moral teachers of modern times—teachers who flourish in the atmosphere of science. Among these there is a goodly number of moral reformers; in fact, as a class they are all moral reformers, some preaching against this evil, some against that; some exalting this virtue, others exalting that. The moral teachers of the times are more and more eschewing the ancient doctrines of theoretical ethics and devoting their energy to practical ethics. Theories of faith are held in abeyance to theories of practice. It needs but a few generations to come and go before the new teaching of theory will be founded wholly on principles derived from practice. This will be the establishment of scientific ethics.

The agencies of religion are multifarious; the teachers of religion are potent. The organization of institutions of religion are all progressive. They have not to be overthrown, but only to be perfected.

We have identified ethics with religion. The teachers of religion may have erred in theories of ethics, and they may have been instrumental in the enforcement of ethical doctrines by unwise agencies. Some of these agencies have been of a character utterly revolting to modern concepts of good and evil conduct. Usually the religion taught has been the religion believed, though hypocrites have often nestled in the fold. The claim for superior conduct and for the sanctities of its teachings has enticed bad men into the ecclesiastical ranks. Above all

and more than all, the establishment of an official priesthood as one of the functions of government and one of the aristocratic estates has been the cause of abuses and horrors in the name of religion for which the student of ecclesiastical history must forever blush.

As astronomy was developed from astrology, as chemistry was developed from alchemy, as medicine was developed from necromancy, so ethics is the lineal descendant of animism. Purified from animism, religion will remain forever to bless mankind.

Having set forth the nature of ethics, it now remains to classify its subject matter in compliance with the pentalogic qualities.

It is believed that the classification will occur to every attentive reader and that its fundamental nature is evident. It is necessary, therefore, to state the classification without further elaboration. The subject is grouped into (1) the ethics of pleasure and pain; (2) the ethics of welfare and want; (3) the ethics of justice and injustice; (4) the ethics of truth and falsehood; (5) the ethics of wisdom and folly.

It is the province of ethics to teach perfect character by promoting conduct governed by principles instinctively entertained as conscience, so that all acts are spontaneously good. The conduct of such a man is purely ethical.

In the science of economics we find that self-interest is subserved by promoting the interest of others. In the science of institutions it is discovered that justice for self can be obtained only by doing justice to others. Rights may be obtained by performing duties. In the science of ethics we learn that all conduct, egoistic and altruistic alike, must become spontaneous and habitual. Habitual conduct thus spontaneously controlled has its sanctions in conscience. Ethics, therefore, is the science of conduct controlled by conscience.

PETROGLYPHS ON THE AMOOR¹

By BERTHOLD LAUFER

At the confluence of the Orda and the Amoor, near the Gold village of Sakacha-Olen, the right banks of the Orda and the Amoor form a sandy beach, which is covered with innumerable boulders, partly scattered, partly piled up in a long wall, which, seen from the water, conveys the impression that a fortification or a dike had been erected there. A number of these stones bear curious petroglyphs, evidently of great antiquity. Unfortunately, most of these are so much obliterated that it seemed impossible to obtain satisfactory photographs; for this reason tracings of the petroglyphs were made on paper placed over the boulders. The place was visited in the spring, when the river was high, and consequently a number of the petroglyphs were under water. Others were discovered high up on precipitous rocks. Some boulders which were partly buried in sand were excavated, and proved also to be covered with petroglyphs.

The figures represented are partly human faces, partly animals. The general characteristics of the petroglyphs are quite uniform. Figure 29 shows a face of oval form, the nose represented by a triangle, the mouth and lips represented by a single spiral. The eyes also are represented by a spiral ornament, which might be considered as suggesting Chinese affinity. Five lines shown on the forehead probably represent wrinkles or facial painting. Figure 30 represents a figure found on the surface of the same stone from which figure 29 was copied. The similarity of character of these two faces is striking. Figures 31 and 32

¹ Extracted from a report of investigations made under the auspices of the Jesup North Pacific Expedition, and published herein by authority of the Trustees of the American Museum of Natural History.

are reproductions of sketches made of carvings found on rocks some distance from the bank of the river, both of them occurring on one stone. Figure 32 is partly on top of the stone, partly on

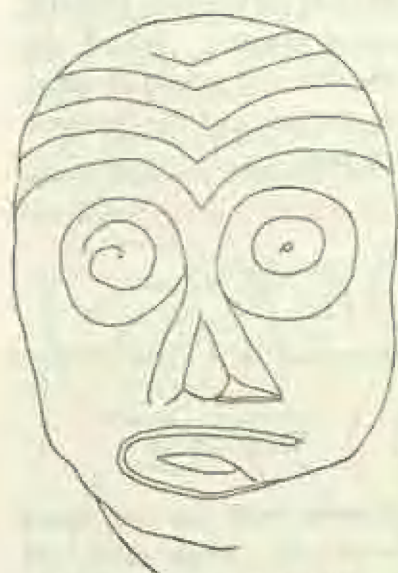


FIG. 29—Petroglyph in form of a face.



FIG. 30—Petroglyph in form of a face.



FIG. 31—Petroglyph in form of a face.



FIG. 32—Petroglyph in form of a face.

its side, one edge of the stone passing through the middle of the petroglyph. In this figure the characteristic spiral design seen in figure 29 will be observed.

Among the representations of animals, that of an elk (figure 33) is the most remarkable. The head and antlers are shown with remarkable realism: there are three spirals on the back of the animal, while the lines on the lower part of the body probably represent ribs. The elk is represented running. Behind this figure is found the face of a man, the chin and mouth of which are on the surface of the stone, while the eyes and the forehead are continued on the adjoining lateral face.



FIG. 33.—Petroglyph of an elk.

There is another petroglyph representing an animal similar to a horse. Tail, back, forelegs, head, eyes, and ears are well preserved, but the remainder is almost obliterated. The Golds stated that representations of animals are very numerous; but at the time of my visit most of them were covered with water. There are three figures on a high precipice which the Golds regard as representations of the *Mudu'r* (the thunder dragon), a conception borrowed from the Chinese. The similarity between the Chinese design and these petroglyphs is very slight. Figure 34 shows a sketch of one of these rock-carvings. Quite recently some Golds have carved the design of a dragon in the same rock. Figure 35 shows some lines found on one of the boulders.

It will require systematic excavations in order to ascertain if the loose boulders mark old burial sites. Some of the Golds maintain that these petroglyphs were made by a people preceding them, whom they identify with the Koreans; but there is also a tradition referring to the origin of these rock carvings, which is as follows:

In the beginning of the world there were only three men, called Shankoa, Shanwai, and Shanka. There were three divers and three swans. Once on a time the three men sent the three



Fig. 34—Amoor petroglyph, said to represent the thunder dragon.

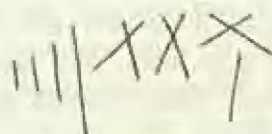


Fig. 35—Amoor petroglyphs,—simple lines.

swans and the three divers to dive for soil, stones, and sand. The birds dived. For seven days they stayed under water. Then they emerged. They brought earth, stones, and sand, and they began to fly about, carrying the earth that they had brought. They flew all around the world. The earth originated when the divers flew, holding earth and stones in their bills. Mountains and plains arose. The divers flew about; and where they flew, rivers arose. Thus they determined the courses of the rivers. They flew toward the sea, and the Amoor river arose. Flying along the shore, they formed bays of the sea.

Then the three men made a man called Ka'do, and a woman called Julchu'. After a while they had a girl, who was called Ma'milji. The people multiplied, and the whole country adjoining the Amoor was populated. Ka'do said, "There are three Suns in the sky. It is impossible to live. It is too hot. I will shoot the Sun." Then his wife said, "Go!" Ka'do went to where the Sun rises. He dug a pit, in which he hid; and when the first Sun rose, he shot him. He missed the second Sun; but

when the third Sun rose, he killed him also. Then he returned. Now it was no longer too hot. Ma'milji drew pictures on stones. Julchu' said, "The people have seen that my husband has killed two Suns." After the Suns had been killed the stones began to harden.

Then Ma'milji said: "There are too many people; there will be no room for them if they do not die. I will die to show them the way." When she was dying Ma'milji said: "The Burunduk does not die; in winter he hibernates; in summer he revives. The Tumna lives as a fish in summer; in winter he hibernates. Thus they will continue to live. The small snake and the large snake will hibernate in winter; in summer they will revive. Other animals shall be born and die. Man shall be born and die."

ANTHROPOMETRY OF SHOSHONEAN TRIBES

By FRANZ BOAS

The statistics on which the following description is based were collected during the years 1891 and 1892 in preparation for the exhibit of the department of anthropology of the World's Columbian Exposition, of which Prof. F. W. Putnam was the director. The anthropometric work of the department was in charge of the writer. The observations were made by Messrs T. L. Bolton and Walter R. Shaw. The tribes included in these statistics are the Shoshoni, the Bannock, and the Uintah, White River, Uncompagne, Moache, Capote, and Weeminuche Ute. The total series embraces 294 individuals, including 33 half bloods.

A comparison between the total results and those obtained by the two observers is first given as a test of the comparability of the material:

MEASUREMENTS OF MEN, 20-50 YEARS OF AGE

	TOTAL.			BOLTON.		SHAW.	
	mm.	Standard Deviation.	Number of Observations.	mm.	Number of Observations.	mm.	Number of Observations.
Stature.....	1661	± 59.2	100	1668	64	1650	45
Finger-reach.....	1732	± 62.5	107	1720	63	1736	44
Height of shoulder.....	1378	± 54.4	100	1382	64	1372	45
Height of point of finger.	637	± 38.8	109	645	64	633	45
Height sitting.....	867	± 32.6	105	867	61	867	44
Width of shoulders.....	386	± 17.9	107	386	62	386	45
Length of head ¹	192.3	± 6.1	124	192.2	73	192.6	52
Breadth of head ¹	152.8	± 4.7	124	153.4	73	152.3	52
Breadth of face ¹	147.5	± 5.8	124	148.5	73	145.9	52
Height of face.....	118.7	± 5.3	108	118.3	63	119.1	45
Height of nose.....	52.2	± 3.0	108	52.4	63	51.8	45
Breadth of nose.....	43.4	± 2.8	108	43.5	63	43.3	45
Height of ear.....	65.2	± 3.1	45			65.2	45
Height of lips.....	15.4	± 3.7	43			15.4	43

¹ Men twenty years and more.

MEASUREMENTS OF WOMEN, 17-59 YEARS OF AGE

	TOTAL			BOLTON,		SHAW.	
	mm.	Standard Deviation.	Number of Observations.	mm.	Number of Observations.	mm.	Number of Observations.
Stature.....	1528	± 35.1	21	1536	10	1521	11
Finger-reach.....	1579	± 31.9	20	1566	9	1584	11
Height of shoulder.....	1260	± 30.5	21	1265	10	1256	11
Height of point of finger.....	585	± 29.7	21	590	10	581	11
Height sitting.....	807	± 23.9	20	800	9	814	11
Width of shoulders.....	346	± 16.2	20	346	9	345	11
Length of head ¹	184.3	±	26	184.3	11	184.1	15
Breadth of head ¹	146.2	±	26	146.5	11	146.0	15
Breadth of face ¹	136.9	±	26	138.0	11	136.1	15
Height of face.....	108.5	±	21	109.9	10	107.2	11
Height of nose ¹	47.1	±	26	46.2	11	46.3	15
Breadth of nose ¹	40.1	±	26	40.5	11	39.9	15
Height of ear.....	61.5	± 3.9	11			61.5	11
Height of lips.....	12.1	± 3.3	10			12.1	10

The agreement between these two series is so close that we may conclude that the methods of both observers were practically identical. The only measurement that shows considerable divergence is that of breadth of face, in which Shaw's measurements are much smaller than those of Bolton. This may be due to the occurrence of narrower faces among the Ute of Colorado which are contained in Shaw's series. Shaw has for 27 adult male Shoshoni an average breadth of face of 147.8 mm., while for 24 Ute of Colorado he has only 143.8 mm. This view is somewhat corroborated by the observations on children. On a former occasion¹ I have given the rates of growth of the breadth of face among Indian children. By adding these values to those observed among Indian children we obtain an approximate idea of the width of face of the adult. Bolton's observations on 14 boys from Utah give a value of 148.0 mm.; Shaw's measurements of 30 Shoshoni boys give an average of 149.5, and of 13 boys from Colorado an average of only 144.5.

I have also measurements of seven children, measured by both

¹ Women seventeen years and more.

² *Verhandlungen der Berliner Anthropologischen Gesellschaft*, 1895, p. 408.

observers, Bolton's measurements antedating those of Shaw by one year. The values observed by Shaw show the following differences from those observed by Bolton:

- | | |
|-----------------------------|----------------------------|
| 1. Length of head....+ 2.3 | 4. Height of face....- 0.6 |
| 2. Breadth of head...+ 1.4 | 5. Height of nose....- 0.1 |
| 3. Breadth of face....+ 4.1 | 6. Breadth of nose...+ 1.3 |

These values suggest a difference in method only in the fourth and fifth measurements which, instead of showing an increase due to growth, show a decrease. It would seem, therefore, that, among children, Shaw made these two measurements smaller than Bolton. Since Bolton had an extended practice under my personal supervision, particularly in measuring children, in Worcester, Mass., I regard his measurements as perfectly trustworthy. The averages of adult males do not show the same differences. This may be due to the fact that the location of the naso-frontal suture is much more easily ascertained in this case than in children and women.

On the whole it seems justifiable to treat both observers as following the same methods. If this is admitted we may suppose that the difference in breadth of face between the Shoshonean tribes of Utah and of Colorado does really exist. In all other respects the various tribes represent a uniform type, as shown by the following table of averages:

Stature.		Length of Head.		Breadth of Head.		Breadth of Face.		Height of Face.		Height of Nose.		Breadth of Nose.
Shoshoni.....	1665 (42)	193.5 (43)		153.1 (43)		148.2 (43)		118.8 (42)		52.7 (42)		43.0 (42)
Bannock.....	1685 (6)	191.5 (7)		150.7 (7)		147.0 (7)		122.5 (6)		52.7 (6)		43.0 (6)
Uintah.....	1641 (34)	192.4 (41)		152.8 (41)		148.0 (41)		118.7 (33)		52.1 (33)		43.2 (33)
White River...	1652 (5)	189.7 (6)		155.0 (6)		150.3 (6)		118.8 (5)		51.2 (5)		43.0 (5)
Uncompagne..	1628 (4)	189.3 (4)		153.5 (4)		146.9 (4)		115.3 (4)		51.5 (4)		44.5 (4)
Moache.....	1650 (14)	190.6 (16)		152.1 (16)		143.4 (16)		118.2 (14)		52.6 (14)		42.4 (14)
Capote.....	1705 (2)	194.8 (5)		153.6 (5)		145.0 (5)		118.5 (2)		48.5 (2)		44.5 (2)
Weeminuche..	1647 (3)	190.3 (3)		149.0 (3)		143.7 (3)		116.3 (3)		48.7 (3)		42.0 (3)

The whole series is distributed as follows:

MEASUREMENTS OF WOMEN

cm.	Stature.	Upper reach.	cm.	Height of Shoulder.	cm.	Height of Sternum.	cm.	Width of Shoulders.	mm.	Length of Head.	mm.	Breadth of Head.	Breadth of Face.	mm.	Height of Face.	mm.	Height of Nose.	Breadth of Nose.	Height of Ear.	mm.	Height of Lip.
147	1								127		128		1								
148	1							4	129		129		1								
149	1							4	130	1	130		3								
150	1							4	131		131		1								
151	1							2	132		132		1								
152	1							1	133	1	133		1								
153	1							1	134		134		1								
154	1							1	135		135		1								
155	1							1	136		136		1								
156	1							1	137		137		1								
157	1							1	138		138		1								
158	1							1	139		139		1								
159	1							1	140		140		1								
160	1							1	141		141		1								
161	1							1	142		142		1								
162	1							1	143		143		1								
163	1							1	144		144		1								
164	1							1	145		145		1								
165	1							1	146		146		1								
166	1							1	147		147		1								
167	1							1	148		148		1								
168	1							1	149		149		1								
169	1							1	150		150		1								
170	1							1	151		151		1								
171	1							1	152		152		1								
172	1							1	153		153		1								
173	1							1	154		154		1								
174	1							1	155		155		1								
175	1							1	156		156		1								
176	1							1	157		157		1								
177	1							1	158		158		1								
178	1							1	159		159		1								
179	1							1	160		160		1								
180	1							1	161		161		1								
181	1							1	162		162		1								
182	1							1	163		163		1								
183	1							1	164		164		1								
184	1							1	165		165		1								
185	1							1	166		166		1								
186	1							1	167		167		1								
187	1							1	168		168		1								
188	1							1	169		169		1								
189	1							1	170		170		1								
190	1							1	171		171		1								
191	1							1	172		172		1								
192	1							1	173		173		1								
193	1							1	174		174		1								
194	1							1	175		175		1								
195	1							1	176		176		1								
196	1							1	177		177		1								
197	1							1	178		178		1								
198	1							1	179		179		1								
199	1							1	180		180		1								
200	1							1	181		181		1								
201	1							1	182		182		1								
202	1							1	183		183		1								
203	1							1	184		184		1								
204	1							1	185		185		1								
205	1							1	186		186		1								
206	1							1	187		187		1								
207	1							1	188		188		1								
208	1							1	189		189		1								
209	1							1	190		190		1								
210	1							1	191		191		1								
211	1							1	192		192		1								
212	1							1	193		193		1								
213	1							1	194		194		1								
214	1							1	195		195		1								
215	1							1	196		196		1								
216	1							1	197		197		1								
217	1							1	198		198		1								
218	1							1	199		199		1								
219	1							1	200		200		1								
220	1							1	201		201		1								
221	1							1	202		202		1								
222	1							1	203		203		1								
223	1							1	204		204		1								
224	1							1	205		205		1								
225	1							1	206		206		1								
226	1							1	207		207		1								
227	1							1	208		208		1								
228	1							1	209		209		1								
229	1							1	210		210		1								
230	1							1	211		211		1								
231	1							1	212		212		1								
232	1							1	213		213		1								
233	1							1	214		214		1								
234	1							1	215		215		1								
235	1							1	216		216		1								
236	1							1	217		217		1								
237	1							1	218		218		1								
238	1							1	219		219		1								
239	1							1	220		220		1								
240	1							1	221		221		1								
241	1							1	222		222		1								
242	1							1	223		223		1								
243	1							1	224		224		1								
244	1							1	225		225		1								
245	1							1	226		226		1								
246	1							1	227		227		1								
247	1							1	228		228		1								
248	1							1	229		229		1								
249	1							1	230		230		1								
250	1							1	231		231		1								
251	1							1	232		232		1								
252	1							1	233		233		1								
253	1							1	234		234		1								
254	1							1	235		235		1								
255	1																				

The tabulation of the series of cephalic index for the two observers, and for men, women, boys, and girls, gives the following results:

<i>Men.</i>		<i>Women.</i>		<i>Boys.</i>			<i>Girls.</i>		<i>Adults.</i>	<i>Children.</i>	<i>Total.</i>
Bolton.	Shaw.	Bolton.	Shaw.	Bolton.	Shaw.	Boys.	Bolton.	Shaw.			
72.....	1	—	—	—	—	—	—	—	1	—	1
73.....	—	—	—	—	2	—	—	—	—	2	2
74.....	1	—	—	—	1	—	—	—	1	1	2
75.....	3	1	2	1	2	—	—	—	6	2	9
76.....	4	6	—	—	4	—	—	4	10	20	18
77.....	5	10	1	4	1	—	—	2	20	3	23
78.....	13	3	—	2	1	—	1	4	18	6	24
79.....	25	3	1	3	9	—	—	7	20	17	37
80.....	14	10	2	2	6	1	—	7	28	18	46
81.....	7	7	4	1	4	—	—	9	19	14	33
82.....	2	2	—	—	2	3	—	1	4	6	10
83.....	6	3	—	3	1	7	—	3	12	13	25
84.....	3	1	—	—	2	—	—	3	6	5	11
85.....	3	—	1	—	1	—	—	2	4	3	7
86.....	—	1	—	—	1	—	—	1	1	2	3
87.....	—	—	—	—	—	—	—	4	—	4	4
88.....	—	—	—	—	—	—	—	1	—	1	1
89.....	1	—	—	—	1	—	—	—	1	1	2
90.....	—	—	—	—	—	—	—	—	—	—	—
91.....	—	—	—	—	1	—	—	—	—	1	1
Average ..	79.7	79.7	79.5	79.4	81.2	80.0	78.0	81.1	79.5	80.6	79.96 ± 3.04
Cases	73	52	11	15	13	1	1	50	151	108	259

It will be noticed that these series are quite uniform. Children are, as usual, a little more short-headed than adults. The variability for adults alone has the extremely low value of ± 2.7 ; that of children is ± 3.3 . The coefficient of correlation for Bolton's series of men is $+0.36$, for Shaw's series of men $+0.41$, for the total series of men $+0.38$. In this also we have corroboration of the accuracy of the head measurements. The coefficient of correlation is remarkably high—much higher than among the Sioux Indians.

The average values presented on pages 751, 752, give us the following table of average indices:

	<i>Men.</i>	<i>Women.</i>
Index of finger-reach.....	104.3	103.3
Index of height of shoulder.....	83.0	82.4
Index of height of second finger.	38.4	38.3

	Men.	Women.
Index of length of arm.....	44.6	44.1
Index of height sitting.....	52.2	52.7
Index of width of shoulders.....	23.2	22.6
Cephalic index.....	79.5	79.5
Facial index.....	80.5	79.2
Nasal index.....	83.1	85.1

In order to test the value of certain descriptive features I instructed Mr Shaw to record the size of ear and thickness of lips as large, medium, small, and as thick, medium, thin. In the former case I made sure that there should be a considerable interval between the judgment and the measurement by placing them on opposite sides of the blank; thus an unbiased judgment was obtained. In the judgment of the lips the measurement was written in the space following the former. Mr Shaw did not record any middle-sized ears—only large and small. The distribution is as follows:

mm.	Size of ear of men judged as:		Size of ear of women judged as:		mm.	Lips of men judged as:			Lips of women judged as:		
	Large.	Small.	Large.	Small.		Thick.	Medium.	Thin.	Thick.	Medium.	Thin.
52				1							
53				1							
54	—	1		—							
55	—	—		—							
60	—	3		1	5	—	—	—	—	—	1
61	—	3	1	1	6	—	—	—	—	—	—
62	—	2	2	1	7	—	—	—	—	—	1
63	—	3	1	—	8	—	—	2	—	—	1
64	—	4	—	—	9	—	—	3	—	—	—
65	3	2	—	3	10	—	—	2	—	—	1
66	2	5	3	—	11	—	2	2	—	2	2
67	2	2			12	—	6	—	—	2	—
68	3	2			13	—	2	—	—	1	—
69	1	—			14	—	3	—	—	—	—
70	1	2			15	—	2	—	—	1	—
71	2				16	—	2	—	—	1	—
72	1				17	1	3	—	1	—	—
73	1				18	3	2	—	—	—	—
74	1				19	3	—	—	—	—	—
75	—				20	4	—	—	—	—	—
76	—				21	1	—	—	—	—	—
77	—				22	1	—	—	—	—	—
78	—				23	1	—	—	—	—	—
79	1				24	—	—	—	—	—	—
	23	29	7	7		14	27	9	1	7	6

These series, particularly the first two, which exhibit a more unbiased judgment, show a very strong overlapping, which signifies a considerable ambiguity of the terms large and small. It will easily be seen that different observers would use the same terms with still less accuracy, so that we must conclude that descriptive features like those mentioned here are of value only in extreme cases.

ANTHROPOLOGY AT COLUMBUS

By W J MCGEE

The Forty-eighth meeting of the American Association for the Advancement of Science was held in Columbus, Ohio, August 19-26 last. The attendance was something over three hundred and fifty, i. e., considerably above the average; there was somewhat exceptional local interest, with decided promise of beneficial influence on the scientific and educational institutions of the region; while the papers were materially above the average in number and quality. Accordingly the meeting was a somewhat exceptionally satisfactory one. While the Section of Anthropology was not especially distinguished in attendance or in number of papers, the position of the science was well maintained, partly through the presentation of papers and addresses of anthropologic bearing in other sections—particularly in the Section of Social and Economic Science, which was unprecedentedly strong, and which, perhaps for the first time, came well to the fore among the sections in the interest and importance of its sessions.

An anthropologic tone was given to the entire meeting through the address of the retiring President, Prof. F. W. Putnam, under the title "A Problem in American Anthropology." This address has already been placed within reach of readers in the columns of *Science* (vol. x, pp. 225-236), and *Nature* (vol. 60, pp. 451-455), as well as in other publications. The tone was maintained in the well-attended address of Vice-president Wilson on the "Beginnings of the Science of Prehistoric Anthropology," which is about to appear in *Science*.

The Section of Anthropology was organized under Vice-president Wilson by election of E. W. Scripture as secretary, W J

McGee as councilor, and Robert Clarke, Frank Russell, and George Grant McCurdy, with J. McK. Cattell and M. H. Saville (both *ex-officio*) as sectional committee, and Amos F. Butler as representative of the section in general committee. The more general work of the section comprised (1) memorial proceedings on the death of Dr Daniel G. Brinton; (2) presentation and discussion of a report of the Association committee on the White Race in America, which was forwarded and adopted by the Association at Large; (3) an informal report on the winter meeting held in New York in December, 1898; (4) decision to hold a winter meeting during the Christmas holidays of 1899 at a point to be selected by the sectional committee (a decision subsequently ratified by the council of the Association); (5) appointment of a committee to promote anthropologic teaching in universities.

The committee on the White Race in America consists of J. McK. Cattell, W. W. Newell, W J McGee, and Franz Boas. The report summarized previous work, and recommended the acquisition of anthropometric apparatus, to be used for making standard measurements of members of the Association in attendance at the meetings to such extent as might be found expedient, proposing an appropriation for the purpose.

A small appropriation was made by the council of the Association to defray the cost of printing in connection with the winter meeting, which will probably be held in New Haven, in connection with the American Society of Naturalists and the American Folk-lore Society.

The committee on anthropologic teaching in universities, appointed subsequent to the meeting, consists of W J McGee of the Bureau of American Ethnology, George Grant McCurdy of Yale University, and Frank Russell of Harvard University.

Of the twenty papers introduced in the program of the section, but one related exclusively to somatology; this was an elaborate illustrated communication by Dr Frank Russell, entitled "A Comparative Study of the Physical Structure of the Labrador

Eskimos and the New England Indians." The communication was based on critical study of the large quantity of material in Peabody Museum; and the measurements show considerable and consistent skeletal differences between the two groups. Somatology and psychology were conjoined in Dr Cattell's communication, "New Anthropometric Methods," which was important as a suggestion—if not a demonstration—that psychology furnishes a clue leading through the interminable tangle of anthropometric data; for the essence of structural facts resides in actions and reactions which always reveal a dominant psychic factor. Equally definite and practical, as representing a bridge between body and mind, was Dr Scripture's paper, "Inadequacy of the Present Tests for Color-Blindness, with Demonstrations of a New Test"; while modern psychology, with its clear physical basis, was exemplified in two other papers by the same author, "Observations on After-Images and Cerebral Light" and "Observations on the Economy of Sleep." Closely related to this was the paper on "Defective Vision of School Children," by A. G. Fried in Section I, together with "Time of Perception as a Measure of the Intensity of Light," and "Relations of Time and Space in Vision," by Dr Cattell in Section B.

Esthetology was gracefully represented by "The Natural Diatonic Scale: a Chapter of Musical History," by Charles K. Wead, and by the same author's papers in the Section of Physics on "The Musical Scales of the Arabs" and "Medieval Organ Pipes and their Bearing on the History of the Scale"; while Dr Scripture's illustrated account of "Researches in Experimental Phonetics, with Demonstration of Results," before the Section of Anthropology, was an instructive analysis of musical factors.

Technology was represented only in its prehistoric aspects. A valuable contribution to American archeology was made in the paper on "The Aboriginal Quarries and Shops at Mill Creek, Miami County, Illinois," by Dr W. A. Phillips, which was illustrated by maps and diagrams, and by numerous specimens of

quarrying tools and of quarry products in various stages, from raw material to finished implement, with examples of wastage and rejectage at each stage. Another valuable contribution was an account of the "Prehistoric Settlement, Big Kiokee Creek, Columbia County, Georgia," by Dr Robert Steiner (presented by Vice-president Wilson), the paper being based on the Steiner collection of aboriginal material, now in the National Museum, which is of large interest as a practically exhaustive collection from a typical district of aboriginal occupancy. Of related subject were "Evidences of Ancient Prehistoric Man in the Maumee River Basin," by Dr Charles E. Slocum; "The Latest Discoveries of Traces of Glacial Man at Trenton, New Jersey, and the Light Thrown upon them by a Comparative Study of the Gravels of the Delaware and Susquehanna Valleys," by G. F. Wright, and "Recollections of M. Boucher de Perthes," by Vice-president Wilson.

Naturally, sociology was represented mainly in the Section of Social and Economic Science, finding expression in a number of important papers, among which may be enumerated "Natural Distribution as Modified by Modern Agriculture," by John Hyde; "Trusts: a Study in Industrial Evolution," by H. T. Newcomb; "Moral Tendencies of Existing Social Conditions," by Washington Gladden; "Science and Art in Social Development," by John S. Clark, and "The Manual Element in Education," by C. M. Woodward.

Sophiology was developed especially in "The Cherokee River Cult," by James Mooney, and "Allan Stevenson's Trance," by Dr Robert Steiner, and incidentally in "The Beginnings of Mathematics," by W J McGee (printed on pages 646-674 of this number); while some of the papers in the Section of Social and Economic Science were of related import.

Of somewhat general character were the papers before the anthropologic Section on "The Scientific Societies and Institutions of the United States," by Dr Cattell, and the "Extent of Instruction in Anthropology in Europe and America," by

Dr. McCurdy; and of definite anthropologic bearing were the papers in the Section of Social and Economic Science on "Calculations of Population in June, 1900," by Henry Farquhar, and "The Increase in the Median Age of the Population of the United States since 1850," by Mansfield Merriman. Professor Merriman's paper was suggestive, incidentally as forming a means for trustworthy age determination in the broadly collective way, and directly as indicating the rapid increase of viability in this country under existing social and economic conditions; his figures indicating that the mean age of Americans is some years greater today than it was even so late as the middle of the century.

Peculiarly germane to the work in the Sections of Anthropology and of Social and Economic Science, by reason of the prominence given to the broader humanities forming the basis of modern anthropology, was the vigorous opening address of the venerable President of the Association, Professor Edward Orton. Summarizing the growth of knowledge, from primal darkness through the shadow of the Middle Ages and into the enlightenment of the nineteenth century, he noted three advances in the essentially human activities as buttresses of all scientific progress, viz: Arabic numerals, the alphabet, and the printing press. And his view of the splendid present and brilliant future of science was quite in accord with that of the normal anthropologist: "The field, which is the world, was never so white unto the harvest as now; yet it is still early morning on the dial of science." Coming from an eminent geologist, the words are peculiarly grateful to students of Human Science; and they acquire a permanent significance as among the last public utterances of one of America's pioneers in knowledge-making. Professor Orton died on October 16.

DANIEL GARRISON BRINTON, A.M., M.D., LL.D., Sc.D., an Editor of the *American Anthropologist*, Professor of American Linguistics and Archeology in the University of Pennsylvania, Professor of Ethnology and Archeology in the Academy of Natural Sciences at Philadelphia, Associate Editor of *Science*, and Founder of the *Library of Aboriginal American Literature*, died at Atlantic City July 31, aged sixty-two years.

Dr Brinton was an active and versatile student of anthropology in all its aspects. His contributions to the science were many and important; his publications form a conspicuous part of the literature of American anthropology, while his editorial and professorial work and his labors in the lecture field and in scientific organizations aided materially in promoting and diffusing anthropology. His death is a serious loss to science.

A frequent contributor to the *American Anthropologist* in its earlier form, Dr Brinton was one of the foremost among the projectors and supporters of the journal in the new form and more extended scope; and the loss occasioned by his death will be particularly felt by the editorial staff and readers of this journal.

A more extended memorial, with a resume of Dr Brinton's work, is reserved for another number.

ANTHROPOLOGIC LITERATURE

Archæology of Lytton, British Columbia. By HARLAN I. SMITH. (Memoirs of the American Museum of Natural History, vol. II, Anthropology I.) New York: May 25, 1899. 4°, pp. 129-161, pl. xiii.

This publication, being a portion of the results of the Jesup North Pacific Expedition, relates entirely to the archeology of Lytton and its vicinity.

Lytton, so-called for the Secretary of State for the Colonies at the time of the first gold-mining excitement in British Columbia, in 1858, was at one time an important point on the river-route to the interior and subsequently a well-known place on the stage line. It is now little more than a hamlet, with an adjoining Indian village and a station on the Canadian Pacific railway. The native name of the place is Tlk'um-tel'n, and so long as tradition goes back it has been the center of the so-called Thompson River Indians or N'tlakapamuq, a branch of the Salishan stock, the northern representatives of which, in the interior of British Columbia, including these tribes, are generally spoken of as the Shuswap people. There are several old village-sites in the vicinity of Lytton, but the center of the tribal habitat appears to have been on the point of land to the north of the Thompson river where it joins the Fraser. Both the Fraser and the Thompson in this vicinity are too rapid and too much broken for easy navigation, even by good canoemen. The skill of the Thompson river people at the present day is in this respect not great, and there is little to show that they were ever expert on the water; but the junctions of the great valleys of the two rivers, with the land routes following there, the low elevation of the place with consequent favorable winter conditions, and above all its situation as an admirable station for the taking and curing of salmon, caused it to be an ideal site for the residence of people with the habits and mode of life common to those of the interior of British Columbia.

The ancient village-site above referred to is not, however, recorded to have been inhabited in any continuous manner in historic times, for the region; and its burial-place, comprised in a group of low sand-hills (illustrated in the memoir), now constitutes the chief evidence of its former importance. These sand-hills, under the influence of the strong

up-river winds, have been gutted out since the abandonment of the old village-site, and to some extent rearranged from year to year. In 1877 the writer made a collection of skulls and objects which had been deposited with the dead at this place, which since that time has been visited by a number of collectors. Mr Smith, with time and means at his disposal, has now made probably the last important collection which can be secured from the old burial-place, and although other sites are referred to by him, this constitutes the chief point of interest in his investigations.

Interments at this place appear to have ceased at or before the coming of the whites, as evidences are scarcely, if at all, found of materials which may have been obtained from the whites by trade, while many of the older burials must possess an antiquity of at least several hundred years.¹ Neither the objects recovered, however, nor the type of the skulls obtained indicate any notable differences in habits or character from those of the people found there when the whites arrived. In other words, there is nothing to show that natives of the same stock and with similar habits have not continuously inhabited the vicinity since the earliest times represented.

The greater part of Mr Smith's memoir is naturally devoted to the description of the tools, weapons, ornaments, and other objects derived from the burial site, with the help of a number of admirable illustrations, drawn for the greater part from objects collected by himself, but supplemented by others obtained from the same place.

Some of these objects are of special interest. The material of the arrowheads is usually a black, fine-grained augite-porphyrite or "basalt." Many of these are of unusually small size and perfect workmanship, with a tendency to variety in form. With these, and showing a complete mastery of the art of stone-flaking, are various articles of fantastic design to which no particular utility can be assigned. A few such forms are figured, but in the museum of the Geological Survey of Canada are others even more remarkable. Stone hammers or pestles of the kind usually found on the Pacific coast are not uncommon. Jade celts or adzes are also a special feature of this locality, and, as already shown by the writer, this was a place of manufacture of such adzes,² the material being obtained in the form of rolled fragments in Fraser river. Specimens of the materials employed were submitted to Prof. J. F. Kemp of Columbia University, who contributes a note on their physical and mineralogical characters, but is apparently unaware

¹ See also *Transactions of the Royal Society of Canada*, Section II, 1891.

² *Canadian Record of Science*, vol. II, No. 6, April, 1887.

of the analysis of jade from the same locality already made by Dr B. J. Harrington of McGill University.¹ The interesting questions connected with the mode in which the jade boulders were cut up and the adzes trimmed to shape are also discussed by Mr Smith, who arrives at the conclusion that the work was done chiefly with flat pieces of hard siliceous sandstone, fragments of which, evidently used for this purpose, are commonly found. Other modes of cutting up boulders of jade or allied materials, however, were also in use, as indicated by specimens in the collection of the Geological Survey of Canada, some of which, with little doubt, have been worked upon with fragments or crystals of quartz, as stated by the natives of the present day, and confirmed by inquiries made by Mr Hill-Tout.

Straight pipes, resembling cigar-holders in form and made of soapstone, are represented by a number of specimens, some of which have been ornamented by designs in incised lines. These are characteristic, and in them it may be supposed that the tobacco native to the region (*Nicotiana attenuata*) was smoked on occasions of ceremony or festivity. Of implements made of bone or antler, a considerable variety, including wedges, adzes, scrapers, awls, needles, harpoon-points, clubs, and handles of root-digging sticks have been found. The last-mentioned objects are peculiarly the property of women in these tribes, forming the crutch-like handle of a pointed staff employed in extracting the several varieties of roots which at certain seasons are used as food.

Copper, employed chiefly for ornamental purposes and beaten into thin plates, is found in limited quantity. Other ornaments have been made of bone and of several species of sea-shells, including the large *Pecten*, the *Dentalium*, and the *Haliotis* or "abalone." These shells, it will be remarked, imply trade with the coast.

The incised designs already referred to as occurring on some of the pipes are also noticed in certain cases on objects of bone or antler. The writer would be inclined to regard most of these designs as trivial, but explanations are given of them in Mr Smith's memoir which may recommend themselves to some of those versed in native art. In respect to artistic genius and workmanship these natives of the interior of British Columbia were, however, far behind those of the coast, of which their best efforts may be regarded as a faint reflex.

Mr Smith may be congratulated on the opportunity which has been afforded to him of illustrating the archeology of this interesting locality, which, though well in the interior of British Columbia, is situated

¹ *Transactions of the Royal Society of Canada*, Section III, 1890, p. 61.

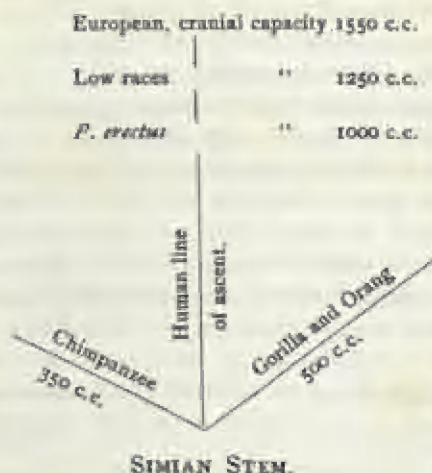
on what must always have been one of the main routes of trade and intercourse between the inhabitants of the interior and those of the coast.

GEORGE M. DAWSON.

Man, Past and Present. By A. H. KEANE, F. R. G. S. [etc.], Cambridge [England]: University Press, 1899. 8°, 584 pp., 12 plates of type portraits.

In 1896 Mr Keane wrote his *Ethnology*, in which the subject of the varieties of mankind is discussed in two parts, fundamental ethnical problems and the primary ethnical groups. In the present volume the author essays to establish the independent specialization of the Negro, the Mongol, the American, and the Caucasian. Already in 1896 Mr Keane had declared, "L'heure des grandes synthèses a déjà sonné," and now the effort is made to present from the point of view of the evolutionist the story of humanity from first to last and everywhere. Of course, you realize that to undertake such a task one must have read widely and been in touch during the last forty years with every worthy writer on any phase of the subject.

The author believes in the specific unity of mankind, of whom he makes four primary divisions, all descended from a generalized proto-human form, the Pleistocene man, from whom they sprung divergently and independently by adaptation to environment. The recently discovered *Pithecanthropus erectus*, found in the Pliocene beds of eastern Java by Dr Eugène Dubois, is the link that brings man nearer to the common stem, as will be seen in the table:



The starting-point is Java, whence man began to spread; erect, but physically and mentally ape-like, though having rudimentary speech. On the question when and where this Pliocene proto-human became the Pleistocene precursors, Mr Keane is a little obscure, inasmuch that both Sergi and Ehrenreich call him a polygenist, but this he hotly denies. For the enactment of all human history a million years of time are demanded.

The bulk of the volume is taken up with the discussion of the four primary divisions, the Ethiopic, the Mongolic, the American, and the Caucasian. Each part is preceded by a thesis or text or conspectus, an excellent arrangement, in which the author lays down in italics just what he means to prove concerning the primeval home, the present home, the physical or anthropographic characters, the mental characters (including speech, religion, and culture), and the main ethnic subdivisions of the group.

The Ethiopic variety is treated under the head of African Negroes and Papuasians, or Oceanic Negroes, which are held to be one, and their subdivisions correspond. Mr Keane's statement of the universal spread of the Papuasians in the Indo-Pacific must be taken with caution. His appreciation of the whole Ethiopic variety is disparaging.

Mongolic man had his root on the Tibetan plateau, and developed two main limbs, the Mongolo-Tatar, who is made to include even the Eskimo, and the Tibeto-Indo-Chinese, with an eastern oceanic offshoot. The development of the Oceanic Mongols becomes especially important now, since the United States has undertaken the care of five millions of them. It is to be hoped that those charged with this discipline will take into their counsel trained ethnologists.

Homo Americanus, with whom the readers of this journal are especially concerned, Mr Keane holds, occupied the Western Hemisphere from Point Barrow to Fuegia in Pleistocene times. He reached America in the primitive state, by two streams of migration, the eastern, long-headed, or Eskimo-Botocudo, the earliest; and the western, later, short-headed, new Stone-Age stream. And then the trails were closed. No doubt Mr Keane can find in recent literature statements by most excellent authorities to the effect that "stone implements and many other things are found in the latest Pleistocene deposits of valleys and plains everywhere throughout America." But this is only the writer's opinion, not a fact. For us, a fact is an exact agreement between what exists and what is said to exist, and on this plea, the latest researches of the Bureau of American Ethnology do not confirm the existence of the Pleistocene American. But the readers of this journal will also be amazed to find that two of our colleagues have been utterly ignored from

lid to lid,—the late Dr Daniel G. Brinton, the only man who ever wrote a book on the American race, and Professor William H. Holmes, head curator of anthropology in the United States National Museum, who has dug out of the earth more stone implements than all the rest of us combined, whose researches are limited only by two oceans.

A large space—over a hundred pages—is given to Caucasian man, who became such, originally, in north Africa. This is par excellence the battle-ground of theorists, and Mr Keane himself thinks that a return to chaos is threatened. The questions of terminology, language versus blood, of the African origin of all the Caucasian types, are discussed at length. The three biological types of Europe, the Teutonic, the Alpine, and the Mediterranean, according to this author were all established in Mauritania. Much space is given to the Hamites, diffused over a vast area in northern Africa, Europe, and Asia. The Hittite question is left in abeyance, the Pelasgians are the foundation of Hellenic culture. The last chapter traverses the ground of Dr Ripley's recent work, *The Races of Europe*. The latter, however, rests its argument wholly on biological ground, while Mr Keane calls to the witness-stand likewise the philologist and the culture-historian.

We would call the editor's attention to the imperfect manner in which he has prepared the illustrations and to the poverty of the index, some authors quoted in the text not being in the list at all, and for others who are mentioned, all the places of quotation are not indicated. In a summary the index is of first importance. O. T. MASON.

The Races of Europe, a Sociological Study. By WILLIAM Z. RIPLEY. Accompanied by a *Supplementary Bibliography of the Anthropology and Ethnology of Europe, published by the Public Library of the City of Boston.* New York: D. Appleton & Co., 1899. 8°, 624 pp., 222 type portraits, 86 maps and diagrams.

The readers of this journal have been expecting this crowning volume to the author's articles in the *Popular Science Monthly* on the "Racial Geography of Europe." The work is bound to have a wide circulation. It represents an amount of painstaking labor which few are fitted or willing to perform. The author, his wife, the Boston Public Library, the publishers, with the coöperation of the ablest specialists at home and abroad, all conspired to produce the best results of the last twenty years in physical anthropology.

The mechanical execution is good—type, portraits, maps from many sources reduced to a common graphic significance, the bibliography, footnotes, methods of referring to the same author again and again,

contribute to the production of an attractive and useful summary of scattered information. There is only one fault to find in this regard. You cannot find from any index where Dr Ripley has quoted you.

The work is out and out biological. The author goes out of his way to remind the reader, again and again, that race has naught to do with speech or arts or social structures. Race is blood or breed—not in an old-fashioned sense of fixed species, not in the view of modern types, but in an ideal sense. You cast your eyes over the varied populations of Europe and discover many types, but at root there are only three races or zoölogical groups, each possessed of a history of its own. "Our three racial types are not radically distinct seeds which, once planted in the several parts of Europe, have there taken root; and, each preserving its peculiarities intact, have spread from those centers outward until they have suddenly run up against one another along a racial frontier. . . . These types for us are all offshoots from the same trunk." The following table will show the gist of the problem :

<i>Race Type</i>	<i>Head</i>	<i>Face</i>	<i>Hair</i>	<i>Eyes</i>	<i>Stature</i>	<i>Nose</i>	<i>Synonyms</i>	<i>Used by</i>
I. TEUTONIC	Long	Long	Very light	Blue	Tall	Narrow, Aquiline	Dolicho-lepto Reihen gräber Germanic Kymric Nordic Homo Europæus	Kollmann Germans English French Deniker Lapouge
II. ALPINE (Celtic)	Round	Broad	Light, Chestnut	Hazel, Gray	Medium, Stocky	Variable, Broad, Heavy	Celto-Slavic Sarmatian Dissentis Arvernian Occidental Homo Alpinus Lappanoid	French von Holder Germans Beddoe Deniker Lapouge Pruner Bey
III. MEDITERRANEAN,	Long	Long	Dark brown or black	Dark	Medium Slender	Rather broad	Iberian Ligurian Ibero-Insular Atlanto-Mediterranean	English Italians Deniker

When the author comes to lay his plan upon the actual populations as set forth in Deniker's scheme of Europe, it will not fit. But there is a ready explanation for this in the fact that environment, in its widest

sense, anthropic as well as terrestrial, has been playing on men's bodies and minds, shaping not so much their skulls as the outer parts.

The first biological characteristic discussed is the head form. Only two types are recognized—long heads and short heads. Mesocephalism is not taken into account. In Ripley's map of Europe a black belt of brachycephalism, crossing its middle, separates two areas of dolichocephalism north and south. So you have the Alpine round-heads between the Teutonic and the Mediterranean long-heads. The author shows how, in cephalic characters, men follow the zoological law that pure types are found in regions of marked geographic individuality.

The second characteristic worked out, though not always in harmony with those of the skull, is pigmentation of the skin, eyes, and hair, which, in spite of climate, is a fixed racial mark among the peoples of Europe. The Alpine populations are darker than the Teutonic, and by their grayish hazel eyes and brownish hair are lighter than the Mediterranean. Environment works effectually in color to traverse heredity. Mountaineers are lighter than the people of the plains, whether from climate, or from poverty, which stands in relation to pigmentation.

The third characteristic presented is stature. The causes of stature and its coördinated marks, eliminating chance variations, are, fundamentally, race, and then environment, natural selection, artificial selection, and habits of life. The result of all these is to the effect that the Teuton is tall, the Alpine and the Mediterranean are of medium height. This is one of the best chapters in the book.

The minute discussion of type characteristics leads to the summing up of the diagnoses for the three race types. Especial interest centers here on the Celtic controversy and leads the author to suggest happily the use of the term *Celt*, or *Kelt* by the philologists, of Hallstatt for the culture usually coördinated with the Celtic language, and Alpine for the racial type.

Three hundred pages, the larger part of the work, are given to applying the race marks laid down to the political divisions and peoples of modern Europe, namely, France and Belgium, the Basques, Scandinavia and Germany, Italy and Spain, Switzerland, the Tyrol, the Netherlands, the British Isles, Russia and the Slavs, Jews and Semites, Greeks, Turks, Magyars, Rumanians, Caucasians, Asia Minor, Russia, and India.

In chapters xvii and xviii the author turns aside from his direct road to do a little cross-country riding after the philologist and students of culture. Having told you to eliminate these in considering the race question (and that is the scientific method of procedure), the book is somewhat weakened by these long digressions.

But in his last three chapters the author is at his best. The anthropologist becomes the instructor of the legislator, the jurist, the economist, and the sociologist. Agriculture, manufactures and trade, divorce and suicide, distribution of intellectuality, competition, migration, crowding of urban centers, color and stature in relation to city life, and (most important in view of the recent acquisition by the United States of an enormous tropical area) acclimatization and the government of the dark races are discussed in the light of ethnology.

Few works on anthropology published in 1899 represent more conscientious labor or will deserve a larger audience. The Supplement, a handy volume of one hundred and sixty pages, is a list of all books and papers quoted, the arrangement being alphabetic by names of authors, and chronologically by titles thereunder. The index, occupying thirty pages, is a list of regions and topics in alphabetic order, the authorities on each being arranged chronologically. The author justly acknowledges the liberal help of the Public Library of the City of Boston in preparing the bibliography and in procuring the works.

O. T. MASON.

Experimental Study of Children. By ARTHUR MAC DONALD. (From the Report of the Commissioner of Education for 1897-98, chapters xxi, xxv.) Washington: 1899. 8°, pp. 987-1204, 1281-1390.

Dr Mac Donald has taken a series of measurements of the school children of Washington, D.C., and in the present paper gives the results of his inquiries. Most important among these are the results relating to the circumference of the head. The author finds that the circumference of the head increases with mental ability as judged by the teacher. The circumference of the head is also larger among the non-laboring classes than it is among the laboring classes. These results are in line with Venn's observations on students at Cambridge, England; and also with the selective series obtained by Porter in St Louis. The author also finds that colored children have a larger circumference of head than white children. This may be due to two reasons: The head of the negro, being more elongated, would have a larger circumference if it had the same size on the level on which the circumference is taken. Furthermore, the stiffness of the hair would probably cause an apparent increase in the size of the head of the negro child. Dr Mac Donald finds that white children are taller, but not so heavy as colored children, and that their height sitting is much larger than that of colored children. This agrees with the well-known fact that negroes have relatively longer limbs than whites, but is of interest as showing that this relation between

the two races prevails in early youth. Another series of observations shows that colored children are much more sensitive to heat than white children.

Unfortunately the method used by Dr Mac Donald in presenting the results of his statistical inquiries is such that it would be impossible to form an idea as to their value, if the variability of the phenomena discussed were not fairly well known from other sources. He gives in his tables the grand totals from which his averages were calculated. These are entirely unnecessary, while the variability of each series and the error of the average, which are essential, are not mentioned at all. As a consequence of this omission a number of the conclusions drawn by the author cannot be considered valid. The following seem doubtful: "Children are more sensitive to locality and heat on the skin before puberty than after; and those of non-laboring classes more than those of the laboring classes." Others cannot be considered as proved: such are, that dolichocephalism increases with decreasing ability; that boys are less sensitive to locality and more sensitive to heat than girls; the statements regarding the relation of height, weight, and height sitting of dull and bright boys; that mixture of nationalities seems to be unfavorable to the development of mental ability. It seems to me likely that all the conclusions bearing upon the changes of mental ability with age are based on the fact that the judgments of the teachers as to mental ability at different ages are not comparable. The teachers judge by the attitude of children toward their lessons. When these are easily grasped they are considered bright. Therefore, if the author shows that dulness becomes more frequent with increasing age, I think he proves that the curriculum of the higher grades is relatively more difficult than that of the lower grades, but not a peculiarity of mental development. The slight differences found in height and weight of dull and bright children are important, because they contradict the validity of Dr Porter's results which were obtained by a different method of classification, namely, by comparing children of the same age in different grades and classing those in advance of the age as bright, those who are retarded as dull. This method of classification is open to the objection of introducing an element of artificial selection due to promotion from grade to grade.

Besides the results of his own studies Dr Mac Donald gives a summary of observations of others, without any attempt at criticism, and a list of instruments for anthropometrical and psychological studies which may be useful to those who have no access to the catalogues of the makers.

Chapter xxv of the Report contains a summary of child study in the United States which is also given in the form of brief extracts from the papers in question.

FRANZ BOAS.

Die Weltanschauung der Naturvölker. Von L. FROBENIUS. Weimar: 1898. 8°, 427 pp., ill.

Judging from the author's opinion expressed in the introduction to this book, we have here one of the most important contributions to ethnology that has ever been published. Dr Frobenius informs us that he has solved the whole question of the origin of African culture, and that it will be an easy matter for him to discover the origins of American culture. It seems almost cruel to disturb the serene complacency of the author and to subject to a critical review his magnificent assertions, which brush aside previous researches of many "good people" with a majestic sweep of the hand; but it is the painful duty of the reviewer to scrutinize the methods even of Dr Frobenius.

Following the advice of the author, we begin reading his book at the end—like a modern novel. We first find a few remarks regarding the significance of primitive religion which would be quite appropriate in a popular exposition of this subject; but they hardly convey any new idea to ethnologists—and notwithstanding Dr Frobenius' argument, I venture to continue to use the term "primitive religion" as signifying the whole range of transcendental ideas and practices of primitive man. He then asserts that what he calls "animalism," i.e., animal anthropomorphism, is the lowest form of mythology. Ancestor worship, which he calls "manism," is another but later form of primitive religion. The mythology of the heavenly bodies develops from the latter, the setting of moon or sun being the symbols of death. All creation myths are of later origin, being inversions of the myth of death. An inversion is found in the ideas that man after death goes to the sun, and that man descended from the sun; that the body is buried in a box, and that the sun in the beginning came out of a box (page 396 *f.*). Another law is formulated by Frobenius as the law of "the transformation of motives." Ideas and objects which serve one purpose in one area will assume a new significance when transplanted to a new region. His third law is that of "interpolation"—by which he means that when two ideas in the course of their development become similar in name or in form, one of them tends to be assimilated by the other. This phenomenon has been called by others convergent evolution. Finally, the author enlarges upon the method that he has pursued and wishes to see pursued in researches bearing upon primitive religions.

His fundamental principle is that we are not acquainted with the whole range of ideas (the knowledge) of any given primitive tribe, but that we know only the manifestations of their knowledge. This he considers partly due to lack of clearness of their concepts, partly to the lack of thorough investigation. The first point, according to his ideas, makes it unnecessary to make detailed inquiries into the connection and history of ideas among the people who hold them (page 403). A second principle is applied in the investigation of the historical connection of peoples as proved by their religions. He says (page 404): "The general traits of development from the animalistic to the solar concept of the world are the same the world over. The differences do not lie in the dominant themes, but in secondary ones. Owing to mixture of ideas which are generally connected with migrations, isolated and fragmentary parts of these ideas develop as customs, myths, artifacts, etc., which continue to exist among the tribes which have not produced them, but simply adopted them."

I have searched the book in vain for as much as an attempt to prove these principles and laws. In the very beginning we find the following: The sun-god Maui is identified by very risky etymologies with the word for bird. The boat which often has the shape of a bird carries the souls into Hades. Birds play an important part in the myths referring to the death of Maui. Birds are used in ceremonials accompanying the burial. There are also ceremonies in which birds are used as symbols of life. This proves to the author's mind that the bird which carries away the soul has come to be considered as the bringer of life. Before we accept such an agglomeration of beliefs and customs as proof of this theory, Dr Frobenius must show that these beliefs have sprung from a common source. Similar ethnic phenomena have so frequently developed from distinct psychical sources, that we decline to accept comparisons which are not based on carefully analyzed facts. I think the absurdity of the author's applications of the "law of inversion" that he has so easily found can best be shown by discussing his explanations of the mythology of the North Pacific coast, with which subject I am familiar: A bird throws down a totem pole. According to his theory this means that the bird which carried up the ancestors throws down the carving representing the latter. Here I should object that other totem poles come up in the same way from out of the sea, or were found in the woods. Why is the one brought by a bird more important than the others? Secondly, the carvings on the totem poles are not ancestors, but mostly protecting spirits; and thirdly—what seems to my mind most important—the Kwakiutl copied the custom of erecting totem poles from their northern neighbors and adapted their

traditions to the new customs. The author also considers the connection between raven, sun, and death as proved by the myth telling of the son of a dead woman ascending to the sky, marrying the daughter of the Sun, and of the son of this couple who becomes the raven. The first part of this myth belongs to the long series of miraculous births; and a comparison of other traditions of the same area proves that this is the essential element in the myth. Then, why are those forms of the myth in which the child of the couple is an animal other than a bird less important than the present one? In short, I find everywhere an entirely arbitrary interpretation of selected myths which seem adapted to prove the author's contentions. The few tales that are mentioned as not in agreement with these theories are said to be misunderstood or late distortions of the pure form of the original myth.

By following the methods pursued in the book anything and everything can be proved. It is fiction, not science.

Dr Frobenius is a man of wide reading and of brilliant ideas. There is certainly some truth in his "law of inversion," and a careful study of the history of customs and beliefs from this point of view might lead to valuable results.

FRANZ BOAS.

The Distribution of the Negritos in the Philippine Islands and Elsewhere.

By A. B. MEYER. Dresden: 1899. 8°, (viii,) 92 + 2 pp.

This publication is a translation of the author's work on the Negritos of the Philippines (1893) brought up to date. Dr Meyer gives a thorough and critical review of the known facts pertaining to the distribution of the Negrito population on the northern coast of the Indian ocean. He shows that all records except those for the Philippine islands, Malacca, and the Andaman islands are open to doubt. He adheres to his opinion, previously expressed, that Negritos and Papuas, notwithstanding the difference of form of skull, belong to the same race. He points out that certain types of men in India, Ceylon, and Sumatra show affinities with the Negritos, but the difference in the form of hair is, however, so great, that they must not be considered as identical. The tendency of the book is to discourage, on account of lack of sufficient data, generalizations based on the supposed occurrence of Negrito types throughout southern Asia.

FRANZ BOAS.

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NOTES AND NEWS

How Baskets Are Rounded—Following up Mr Cushing's paper on *Manual Concepts*, I had an opportunity to watch an Obanike woman making baskets this last summer. She used ash splints of various widths, and sweet-scented grass. The latter was employed single, in bunches, and braided. The ash splints, instead of being hammered out laboriously as in olden times, had been wrought in a Yankee machine; but the woman, instead of being prejudiced against the white man's device, was very much pleased, and said that the machine-made splints were much nicer. At first I was struck by the uniformity in dimensions of a great number of her productions, but this wonder ceased when I observed that her hand and fingers were never idle as metric apparatus and gauges. But what was new to me was the constant use of the knee and the lap for hollowing up the bottoms and for giving rotundity to other forms. We are in the habit of calling in the help of gourds and other natural objects to explain the shapes of ancient textiles and pottery. The only mold this woman employed was herself, and it was charming to see how nimbly the parts of her body came to the service of her hand.

O. T. MASON.

Material of the Mexican Codices—There seems to be a general impression that the ancient Mexican codices were written on paper made from the bark of the maguey (agave species), as this statement appears in the works of all the writers who have mentioned the subject. An examination of certain codices in Spain in 1892 gave rise to the belief that the material is the beaten bark of a tree surfaced with clay or lime. In this connection the numerous ridged stone beaters and smoothers found in Mexico, whose use, in a recent number of *Science*, was surmised to be that of making a texture of bark analogous to Polynesian tapa, are interesting. During a recent extensive journey in Mexico this subject was reexamined and the former conclusion affirmed. It will be seen by those familiar with the century plant that it has no bark. It is true that the chitinous epidermis of the leaves may be stripped off in sheets resembling the finest vellum, but when dry it becomes brittle and intractable, rolling into tight cylinders and curling at the edges. Applied to a rigid backing by means of strong

glue it is even then almost impossible to prevent buckling. It is therefore a material not suited to the codices, and it has not been used for any of those records that the writer has examined. That a texture manufactured from bark was employed by the Mexicans for such purpose may be verified by a visit to the Museo Nacional, where an ancient plan is displayed which is painted on a sheet of softened bark apparently derived from the mulberry tree. WALTER HOUGH.

The Adopted Indian Word "Poquosin"—Mr W. R. Gerard, in the last number of this journal, criticises my article on the word "*Poquosin*," in the January number, and presents certain ideas of his own, veiled in learned grammatical diction, which cover a multitude of errors and mislead the unwary.

During my study of the name *Poquosin* and its equivalents, the root *pdkwa*, "shallow," which he favors, presented itself among other possible derivatives, but it was rejected as not being applicable to the many localities, and not sufficiently descriptive of the causes which led to the use of the term by the Amerind and its adoption by the European. The root *pdkwa* in all dialects was employed more to designate shallow flats or sand-bars in a river, which more or less obstructed the navigation of canoes, than to inundated tracts subject to the widening or opening out of streams or ponds, which made the trails or paths impassable. The root *poqua*, "to open," "to break out," on the other hand, describes these peculiarities far better, as was set forth in my paper, and as numerous abstracts from early records and writers not quoted, as well as personal visits and correspondence, bear ample witness. Mr Gerard, in rejecting the diminutive form of the locative case which I used correctly in accordance with many authorities, and employing in its place the terminal of the inanimate third person singular (Howse, *Grammar of the Cree*, p. 26), has made a great blunder, for he should know that it is contrary to Algonquian nomenclature to use this verbal affix as a locative. If it were proper and possible, why should I not have used it with the radical *poqua*, viz., *poquo-sin*? The reason I did not, was because it would have been bad grammar, for it expresses quality, not location, just the same as does its English equivalent. The examples I quoted of this verbal form from the Ojibwa and Abnaki were simply for comparison of the radical and its application. An Amerind might say in Nipissing, *pakwisan*, "it is shallow," or "it touches bottom," "runs aground," as Cuq translates it, but he would never use the expression to name "a shallow-place"; neither would he say *poquosin*, "it is open," in the place of *poquo-es-ing*, "at the widening." (The final vowel is frequently lost in local names.) In

my use of the diminutive with a locative, I agree with the late Dr Trumbull and other authorities with whom Mr Gerard is totally at variance.

I agree with Mr Gerard, that the word *pokelogan* has no affinity with *pákwa*, "shallow." I simply referred to the name in passing as containing the radical *poqua*, "to open," in a generalized sense, which statement, strangely enough, Mr Gerard confirms by saying that it probably means "an open ditch"—*logan* being a corrupt form of the Algonquian affix of instrumentality.

Finally, as to the name Poughkeepsie, my derivation was also the result of much inquiry, research, and study, and not a hasty suggestion. Most of my early forms, on which it was based, were obtained from the records in the office of the Secretary of State at Albany, although some were furnished by a friend residing at Poughkeepsie. My earliest form antedates Mr Gerard's quotation some three years, and was at first applied to a creek, and the creek again mentioned with the same spelling in 1704. Rittenber (*Indians of Hudson River*, p. 371) says: "In a deed to Arnot Veil, covering the tract, the boundaries are described as beginning at a creek called *Pacaksing* by the river [Hudson] side; in a petition from Wm. Caldwell the orthography is *Pogkeepke*, in an affidavit by Myndert Harmense it is *Pokeepsinck*; in other papers the prevailing orthography is *Poghkeepke*, and finally it is found applied to a pond of water lying in the vicinity of the city, and its signification given as the muddy pond," etc. This pond has been entirely built over; the march of improvement has obliterated all natural features, so that the present dweller within its confines can know but little of the primitive conditions existing more than two centuries ago. If there were nothing else that would show the worthlessness of Mr Gerard's derivation, the taking of the Lenâpé inseparable generic *apuckh*, "a standing-rock" (Mass.—*ompsk*), and employing it as a possible prefix to an impossible name, would be enough to condemn it. It is well known that this generic cannot be so used, and the fact bears witness that Mr Gerard's criticisms are not based on strict rules of Algonquian nomenclature.

WILLIAM WALLACE TOOKER.

International Congress of Prehistoric Anthropology and Archeology—The permanent council of the International Congress of Prehistoric Anthropology and Archeology is organizing its twelfth session in connection with the Paris Universal Exposition of 1900. The congress has been accepted in the official series, and will be held under the patronage of the French government. The organizing committee comprises French specialists of world-wide reputation in this

branch of study, which is itself of universal interest. The president is M. Alexandre Bertrand, curator of the St. Germain Museum of National Antiquities, and the vice-presidents are Professors Gaudry and Hamy of the Museum of Natural History. Among the members are Maspero, De Morgan (now directing excavations in Persia), Oppert, the Celtic scholar D'Arbois, de Jubainville, Baron de Baye, Prince Roland Bonaparte, Professors Berthelot, Milne-Edwards, De Lapparent, Letourneau, Manouvrier, and MM. Salomon Reinach, Salmon, and Topinard. The congress will open on the 20th and close on the 25th of August. The opening session will be held in the Exposition Palais de Congrès. The other meetings will take place in the lecture halls of the Collège de France. The final program for the work of the congress will be drawn up after consultation with students of other countries, to whom the committee is now extending invitation. The card of membership is fifteen francs, and entitles the recipient to all the publications of the congress. The Secretary General is M. le Dr Verneau, Professeur d'Anthropologie, 148 rue Broca, Paris.

The Fourth International Congress of Psychology will be held in Paris, August 20-25, 1900. The organization is left to the French members, and the following are the officers: President, Th. Ribot, professor of experimental and comparative psychology in the Collège de France; Vice-president, Charles Richet, professor of physiology in the Paris Faculty of Medicine; General Secretary, Pierre Janet, Director of the Laboratory of Psychology in the Collège de France. The seven sections and the presidents are as follows: (1) Psychology in its relations to physiology and anatomy, Prof. Matthias Duval; (2) Introspective psychology and its relations to philosophy, Prof. G. Séailles; (3) Experimental psychology and psycho-physics, M. A. Binet; (4) Pathological psychology and psychiatry, Dr Magnan; (5) Psychology of hypnotism and related questions, Dr Bernheim; (6) Social and criminal psychology, M. Tarde; (7) Comparative psychology and anthropology, Prof. Yves Delage. Those wishing to attend the congress should apply to the Secretary, and those desiring to present papers should forward abstracts not later than January 1 next.

New Hebrides Somatology and Folklore—Dr Walter R. Harper, of Sydney, New South Wales, started in April on a trip in the New Hebrides to investigate the somatology and folklore of that group. In a note on the subject *Science* (April 7) says: "We are informed by him that the museums of Australia, although new, have already secured

some remarkable collections representative of Australian ethnology. The museum at Sydney, under the curatorship of R. Etheridge, and the one at Adelaide in charge of Dr Stirling, are especially good owing to the interest of their curators in ethnology. Lately the Western government sent a collecting party into the interior under the leadership of Mr Alex. Morton, curator of the Tasmanian Museum. This expedition was successful and secured among other things a series of carved bullroarers, which are sacred objects there. Lack of funds hampers the work in Australia as elsewhere, and the field is yet largely unknown. Much valuable material remains to be investigated even in the Eastern colonies, while northwest Queensland is especially rich."

Dr Herrmann Meyer in Central Brazil—A letter from Dr Herrmann Meyer, printed in the *Verhandlungen* of the Berlin Geographical Society (Nos. 5 and 6, 1899), gives an account of that traveler's movements down to March last. Dr Meyer was then at Cuyaba, about to set out for the more serious part of his journey, but he had already traveled extensively in the southern provinces of Brazil and gives useful information regarding the present state of affairs in them and also in Mato Grosso. He had visited all the German colonies in the south, and reached the military colony of Alto Uruguay and the district of Misiones; he had also paid a visit to the Detale Indians on the Rio de Varzea, but found that they had retained little of their original character, having become much mixed with the Negro stock. At Nonohay, on the Upper Uruguay, and in several other localities, there are settlements of the same race, which is said to be related to the Caingang of Parana and Santa Catarina. From Pelotas, in the south of Rio Grande, Dr Meyer went overland to Montevideo, and then via Buenos Aires to Diamantino and Cuyaba. Colonel Castro had sought in vain for the legendary "Martyres" mines, but had been shown a supposed ancient burial-place of the Indians near the Kulischu. He was about to start anew in search of the old mines of Arayes. Two Americans, named Williamson, had gone to the Xingu by the Kulischu, but had not since been heard of; while, lastly, an Italian, Dr Pasini, had descended the Arinos and Tapajos in company with a surveyor, and had made an accurate chart of those rivers down to the Salto Augusto. Dr Meyer hoped to obtain for publication some account of their journey. He had been already engaged in anthropological researches, and preparations for his journey to the Xingu were completed. He hoped to announce its successful termination by the end of the year, either from Cuyaba, Goyaz, or Para.

Deaths—On April 11th, Sir MONIER MONIER-WILLIAMS, K.C.I.E., M.A., Hon D.C.L. of the University of Oxford; Honorary LL.D. of the University of Calcutta; Honorary Ph. D. of the University of Göttingen; Honorary Member of the Asiatic Societies of Bengal and Bombay, and of the Oriental and Philosophical Societies of America; Boden Professor of Sanskrit, and late fellow of Balliol College, Oxford, etc. Born at Bombay, 1819; studied at King's College, London, and at the East Indian Company's College at Haileybury; became Boden Sanskrit scholar at Oxford University, 1843, was graduated 1844; professor of Sanskrit at Haileybury College from 1844 to 1858, and at Cheltenham from 1858 to 1860; became Boden professor of Sanskrit at Oxford in 1860, retaining the chair until his death; was knighted in 1886. Among his published works are "Buddhism"; "Brahmanism and Hinduism, or Religious Thought and Life in India"; "Indian Wisdom, or Examples of the Religious, Philosophical, and Ethical Doctrines of the Hindus"; "Modern India and the Indians"; "Hinduism"; "Sanskrit-English Dictionary"; "English-Sanskrit Dictionary"; "Practical Sanskrit Grammar"; "Sanskrit Manual with Exercises"; "Kālidāsa's *Sakuntalā*"; "Vikramorvaśī"; "A Free Translation in English Prose and Verse of the Sanskrit Drama *Sakuntalā*"; "Story of Nala"; "Application of the Roman Alphabet to the Languages of India"; "Practical Hindūstānī Grammar"; "Bāgh o Bahār"; "Indian Epic Poetry"; "The Holy Bible and the Sacred Books of the East."

On July 2, Sir WILLIAM HENRY FLOWER, K.C.B., F.R.S., aged 67 years; conservator of the Museum of the Royal College of Surgeons; Hunterian professor of anatomy (1870-1884); director of the natural history department of the British Museum (1884-1898); president of the Anthropological Institute of Great Britain and Ireland (1883-1885), and of the British Association for the Advancement of Science (1889).

In London, July 5, RICHARD CONGREVE, a well-known writer on Comte's philosophy and on social and political topics, aged 81 years.

At Atlantic City, New Jersey, July 31, DANIEL GARRISON BRINTON, aged 62. A fuller notice appears elsewhere in this number, but an extended account of Dr Brinton's life and work is reserved for a future issue.

At Cincinnati, Ohio, August 26, ROBERT CLARKE, publisher, bibliographer, historian, and archeologist, aged 70 years.

OLUF RYGH, professor of archeology at Christiania, aged 80 years.

On June 14, Dr N. GROTE, professor of psychology and philosophy at the University of Moscow.

Figurines of Domesticated Animals in Austrian Folk-Religion—The well-known ethnologist, Dr Wilhelm Hein, points out in the Berlin *Zeitschrift für Volkskunde*, for 1899, a remarkable parallelism in the folk-religion of Austria and that of the Hopi Winter Solstice ceremony as described in a previous number of the *Anthropologist*. In 1897 Dr Hein's attention was called to certain iron figures of domesticated animals in the collection of Dr Eugen Frischauf, and he later found other specimens, among which were seventy-five in the old half-ruined chapel of St. Ägydius in Schwarzensee. On the first of September, a day dedicated to this saint, the country people from far and near flock to their chapel, where figurines representing horses, sheep, cattle, and other animals are placed on the altar. As to the use of these figures Dr Hein quotes from a letter of Herr Blau who has published an article on types of country churches in Austria. It appears from this letter that at Easter, in Bohemia, a country woman or maid carries one of these figurines to the altar on which an offering of four, five, or ten kreuzer is placed, and after a short prayer the figurine, generally that of a cow, is deposited on a table arranged for that purpose under the choir.

Dr Hein then refers to figurines of domesticated animals in the Hopi kivas at the Winter Solstice ceremony, calling attention to the parallelism in their use with that of the iron images. He points out that this Hopi festival, like Easter, is especially devoted to renewal of life, fertility of the earth, and increase of domestic animals. Near the close of his article Dr Hein recognizes a most significant principle in the use of objects on primitive altars, and makes an important distinction when he points out that these figurines are not votive offerings, used in "*Erfüllung eines Gelübdes*," but are "*Ausdruck eines Wunsches*," a symbolic expression of prayer so constant in primitive religions. There are several types of prayer used in worship: Silent prayer, the highest form of communion of man with the "gods," where no words or other symbols are employed; verbal prayer, implying an anthropomorphic or other conception of gods endowed with organs of hearing. The words used in this type may state the request directly or become symbols of wants or needs unexpressed. In verbal prayer the objects desired, or their symbols, are constantly employed in primitive religion. In a third type, pantomimic, or, as Powell suggests, gesture prayer, the worshiper shows the supernatural beings what he wishes by acting, always making use of objects or symbols of objects needed. Much of primitive ceremony, ordinarily called dramatization, is simply a complicated form of this last mentioned type of prayer which gener-

ally coexists with the second form or that where words are used. A complex example of this type of prayer occurs in the Winter Solstice ceremony at Walpi, Arizona, when a man personating a bird and representing the sun goes to a pile of earth in the kiva and throws into it small sticks or darts symbolizing sunbeams or other fertilizing agencies. This act is a prayer to the sun to fertilize the earth. In a less complicated form of the same type of prayer the priest simply sprinkles water on rain-cloud symbols when he wishes rain; or, in the simplest of all, symbols of objects desired, or even the objects themselves, are displayed on an altar, which accounts for the rain-cloud symbols, the efficacy of water animals, water plants, sea-shells, any and every thing which would suggest to the "gods" the greatest desire of an agricultural people in an arid environment. The stone, clay, and wooden effigies of domestic or other animals in the Winter Solstice altars are used in prayers, and are not regarded by the Hopi as votive offerings, but represent what the worshiper prays for, and he ties his prayer-feather to them to show what he wants. It appears from Dr Hein's article that the iron figurines he describes have similar uses.

J. WALTER FEWKES.

Archeological Contributions—Under the auspices of the Archaeological Institute of America, a meeting will be held for the reading and discussion of archeological papers in New Haven on December 27, 28, and 29 next. Prof. Charles Eliot Norton will give the opening address on Wednesday evening, December 27. The presence with papers of a goodly number of distinguished classical archeologists is assured, and several executive officers of American museums will be present. The executive committee of the Institute desires, however, that the scope of the meeting be as broad as that of the constitution of the Institute, and particularly hopes that the department of American archeology may be well represented. Communications on the subject may be addressed to Prof. Thomas Day Seymour, Yale University.

MINOR NOTES

READERS OF THE Brighton (England) *Herald* are fortunate in being kept advised of scientific progress through frequent contributions from a judicious student known in America both personally and through her writings—Miss Agnes Crane. The issue for August 19 contains two columns of anthropologic notes, taken from *American Anthropologist* (N. S.), *Science*, *Popular Science Monthly*, *Annals of Iowa*, *Bulletin of the Free Museum of the University of Pennsylvania*, and various separate publications. The "Notes" begin with an appreciative obituary of

Daniel G. Brinton. Referring to the action of the Anthropological Society of Washington respecting the name "Amerind," Miss Crane says: "We shall follow the example of the Washington authorities and adopt it henceforth."

"THE ETHNOLOGY OF THE TEETH," by Alton H. Thompson, D.D.S., Topeka, Kansas (8°, 13 pp.), is primarily a plea for odontography, and is addressed to those whose profession gives opportunity for systematic observation and record of the characteristics of human teeth; but it is so extended by example and reference as to constitute a real contribution to knowledge.
(W J M.)

IT IS REPORTED that the explorer, Prof. Wilhelm Joest, who died some time ago during an expedition among the South Sea islands, has left \$75,000 to the Ethnological Museum in Berlin, the interest of that sum to be used for procuring new collections and in assisting scientific expeditions.

THE DECEMBER, 1898, issue of the *Indian Antiquary* (Bombay), recently received, devotes its entire fifty pages to memorials of the late Dr Johann Georg Bühler, professor of Sanskrit and Indian antiquities in the University of Vienna, who met death April 16, 1898, by drowning in Lake Constance. A portrait accompanies the notices.

PROFESSOR MONTELIUS has been appointed Yates lecturer in archeology at University College, London, for the year 1900.

DR H. C. MÜLLER of Utrecht, Holland, contemplates the publication of an International Journal of Linguistics which is to follow the lines of the *International Zeitschrift für Sprachwissenschaft*, five volumes of which were published between 1884 and 1890 by the late Dr F. Techmer of Leipzig.

SOCIETÀ ROMANA DI ANTROPOLOGIA.—The following officers have been elected by the Società Romana di Antropologia for 1899-1900: president, Prof. Angelo Celli; vice-president, Giuseppe Sergi; council, Prof. Carlo Anfosso, Dr Ridolfo Livi, Prof. Giovanni Mingazzini, and Prof. Ezio Sciamanna; secretary, Prof. Lamberto Moschen, vice-secretary, Prof. Antonio Neviani; curator, Dr Ugo G. Vram.

STONEHENGE.—It is announced that Sir Edmund Antrobus is desirous of selling Stonehenge, the famous monument on Salisbury plain, England. Thinking it right that the nation should have the opportunity of purchasing this great relic of antiquity, the owner has offered it to the Government, with about 1300 acres of surrounding land (subject to certain pasturage and sporting rights), for the sum of £125,000.

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